APR 16 1937

# MOTOR AGE

CHILTON PUBLICATION
DEVOTED TO THE INTERESTS OF THE INDEPENDENT REPAIR SHOP

APRIL
1937

## IN THIS ISSUE

***ANNUAL SPRING SERVICE AND TUNE-UP ISSUE***

**Complete, from cover to cover, this issue of Motor Age is a year-round handbook of practical information for every shop operator. It includes new tune-up and service ideas; the annual Tune-up Manual with data on 1937 cars as well as specifications on older cars. Read it for profit and keep it handy all through the year.**

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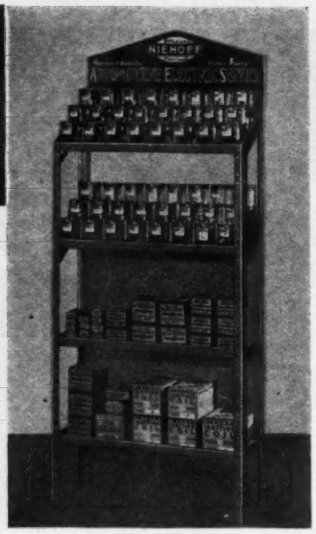


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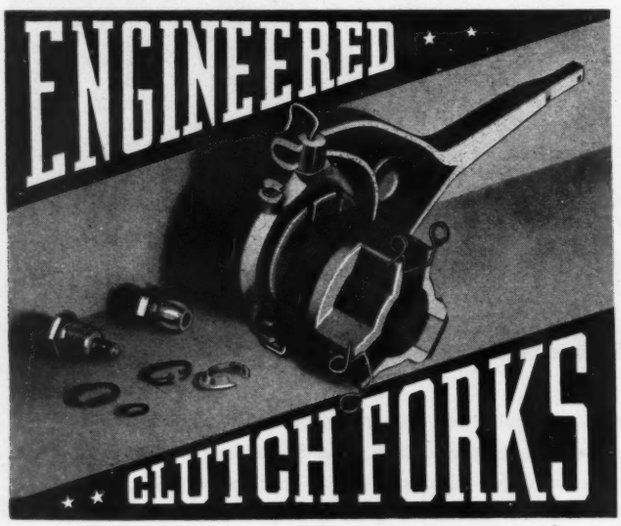


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# MOTOR AGE

DEVOTED TO THE INTERESTS OF THE INDEPENDENT REPAIR SHOP

*Subscriptions for Motor Age are accepted only from independent repair shops and their employees.*

Vol. LVI, No. 5 April, 1937

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Offices: Philadelphia, Phone Sherwood 1424. New York City, 239 W. 39th Street, Phone Pennsylvania 6-1100; Chicago, Room 916, London Guarantee & Accident Bldg., Phone Franklin 9494; Detroit, 1015 Stephenson Bldg., Phone Madison 2090; Cleveland, 609 Guardian Bldg., Phone Main 6860; Washington, D. C., 1061 National Press Bldg., Phone District 6877; San Francisco, 444 Market Street, Room 386, Phone Garfield 6788; Long Beach, Calif., 1595 Pacific Ave., Phone Long Beach 613-238. Subscription Price: United States and Possessions, Postal Union Countries, $2.00 per year; Canada and foreign, $3.00 per year. Single copies, 25c.

Owned and Published by

CHILTON COMPANY
(Incorporated)

Executive Offices
Chestnut and 56th Streets, Philadelphia, U. S. A.

Officers and Directors
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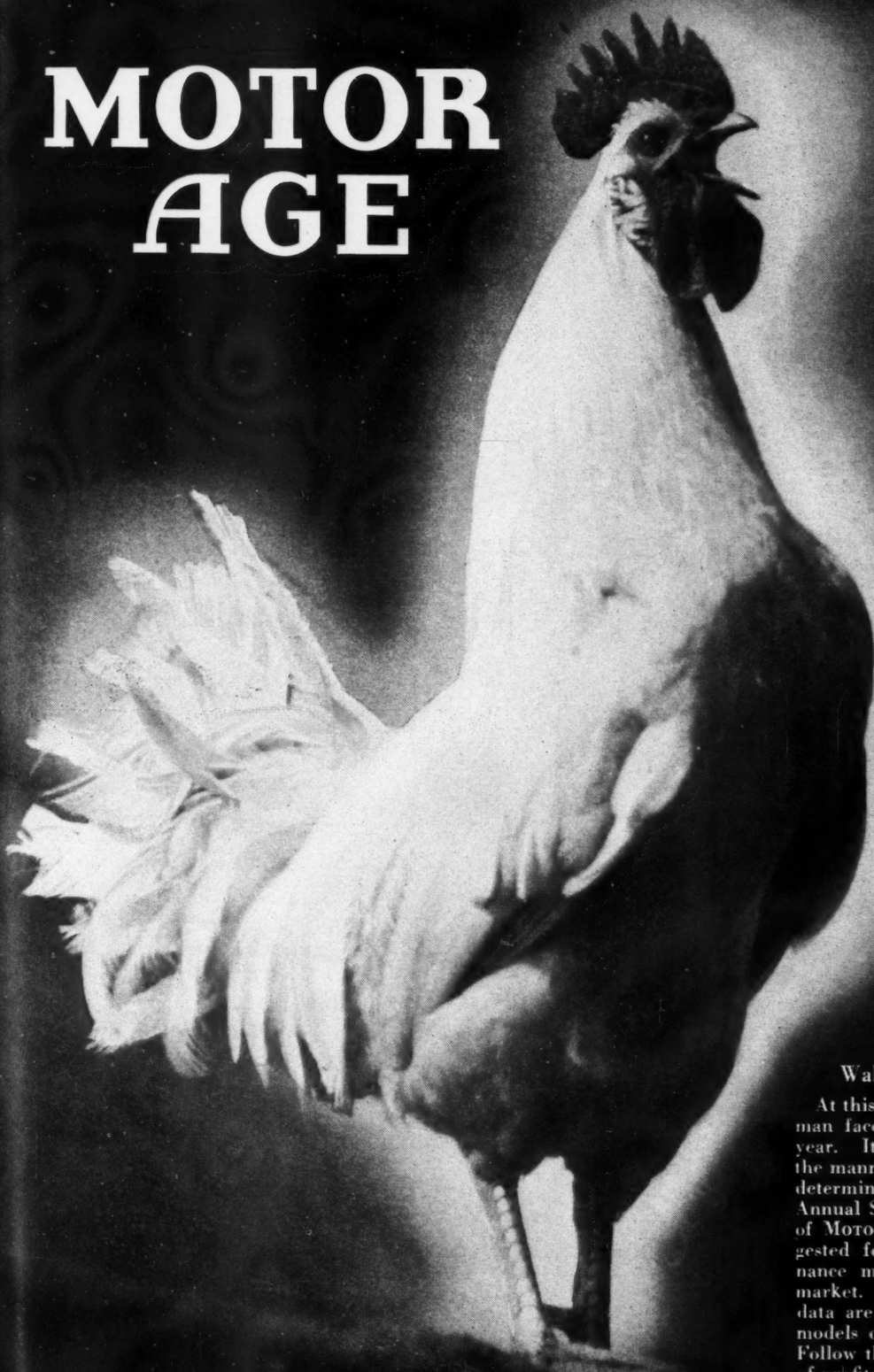
# MOTOR AGE



### Wake Up The Spring Market

At this time the automotive maintenance man faces the best selling season of the year. It is an annual opportunity and the manner in which he faces it very often determines his success or failure. In this Annual Spring Service and Tune-up Issue of MOTOR AGE, ways and means are suggested for preparing shops and maintenance men for this spring maintenance market. In addition, tune-up and service data are presented, not only on the 1937 models of cars but also on older models. Follow the suggestions and get your share of profits by waking up the spring market!

# *Wake Up*
# the Spring Market

# Wake Up Service

THERE is no limit to the variety of automotive services that will be bought by the car owner this spring. All automotive needs from bumper to bumper and from top to tires will be required to put the car in shape after the rigors of winter driving. And the shop that gets the biggest portion of this spring business will be the one that contacts the greatest number of car owners and sells those customers all the services they need rather than let them buy the few items they think they need.

In the automotive service business, just as in other businesses, the more customers contacted, the

# Dollars

## Spring Service Business Begins At The Gas Pump

*By* ***BILL TOBOLDT***

more goods or service will be sold—regardless of whether the goods are potatoes, life insurance, vacuum cleaners or automobile maintenance.

There are many ways of contacting prospective customers. Direct mail letters are good. So is calling prospects by phone. One of the best methods is to contact the customers at the gas pump and lubrication rack.

That method is becoming increasingly popular for the simple reason that it doesn't cost anything. There is no charge for printing and postage. Instead, it actually pays you profits on the gas, oil and grease that you sell, in addition to supplying customers for additional services.

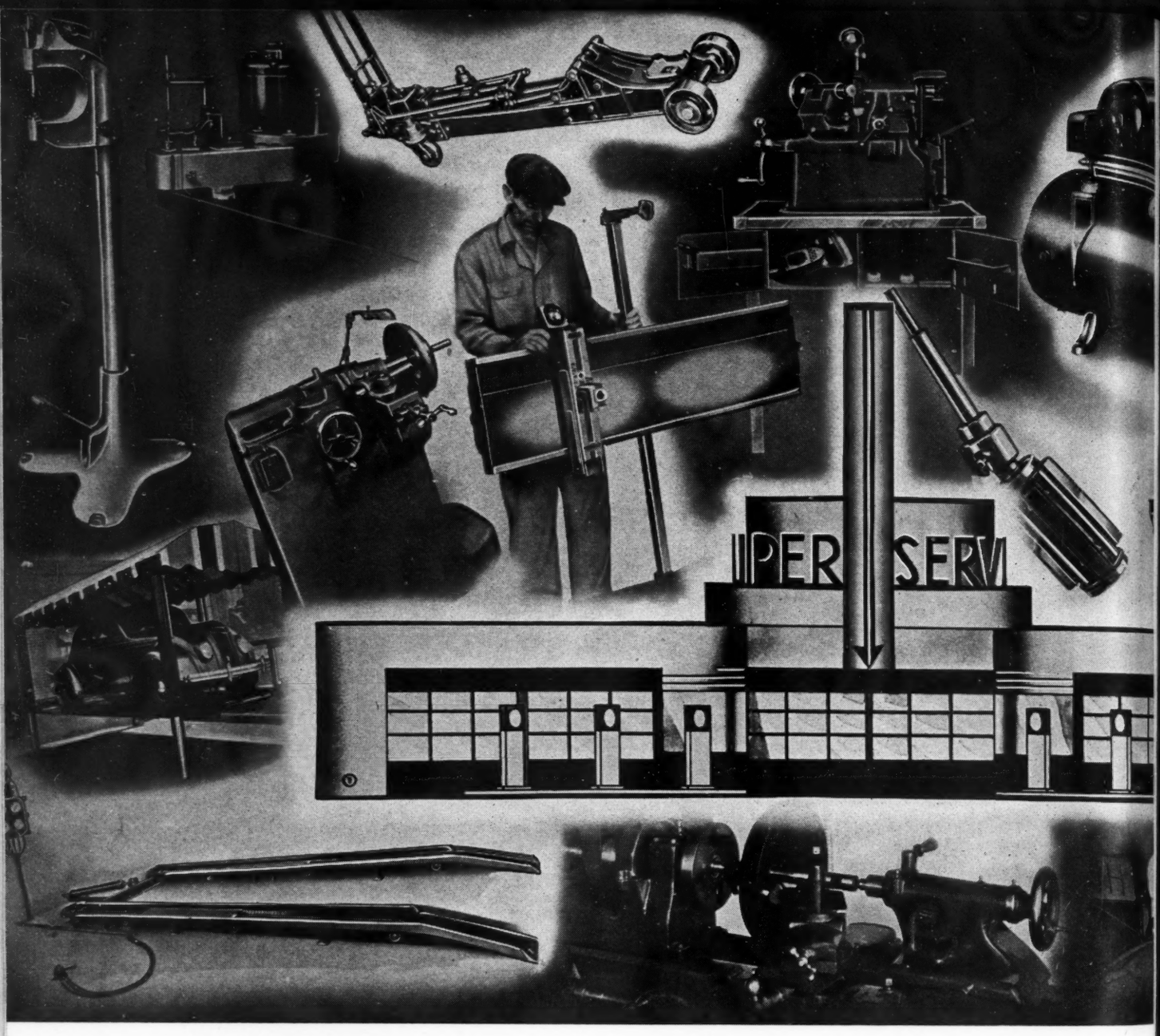
A car owner has to stop at some filling station from two to three times each week for gas and oil and his car requires a lubrication job about once a month. The problem of building up your spring business is then one of getting customers to stop at your station for gas, oil and lubrication, and then selling those customers the spring service their cars need.

Modern gas pumps, coupled with an attractive station, are one of the biggest assets a shop can have. Without an attractive filling station at the front of his shop, the service station manager has to rely on direct mail and the usual forms of advertising to bring in the business.

Gas pumps and lubrication departments can be made to feed the entire shop with business. Brakes, adjustments, wheen alignment, engine tune-up, engine rebuilding, clutch adjustment, transmission repairs and rear axle servicing, headlight service, electrical work, battery and tire sales, radio, car washing, wreck work, painting and polishing and accessory sales can all be increased by proper sales training of the man at the gas pump and lubricating gun.

Such training is easy. The man at the gas pump should be instructed to ask each customer if his car needs lubricating. Or, if the car needs some obvious service

*(Continued on page 81)*



# Wake Up

By FRANK P. TIGHE

SPRING maintenance reawakens countless opportunities to increase equipment earnings. Stay-at-homes, sit-by-the-firesiders are sitting down no longer. In other words, car owners who hibernate during the winter months or who use their cars only when necessary are ready to get up and go. Their first logical stop is the repair shop —the shop that is adequately equipped to serve their needs.

These maintenance spenders hand over a lot of important money every year and to put your shop in a position to get a better share of it, four factors should be considered: The arrangement of the equipment you now own; The condition of that equipment; The extra profit possibilities of new equipment; and, Your ability to make that equipment earn its full measure of maintenance dollars.

Modern service stations arrange shop equipment to attract customers and to serve them more effi-

# Equipment Earnings

ciently. Modern equipment, well arranged, enables the shopman to demonstrate his ability to his customers more convincingly than a circus barker's spiel. The most advantageous spot for your equipment, especially the quick service types, is up front, or near the entrance of your service station, where it can attract trade. There, the equipment becomes a perpetual ad for the shop's facilities.

When you come to check the equipment you now own—consider whether it is earning money or losing money for you. Is it in good repair? How many customers are deserting you for shops that are better equipped and how many jobs are lost because the equipment won't do the job called for? How many jobs are you farming out at a shorter profit?

New equipment will enable you to do additional work at less cost and consequently at greater profit. It will increase the efficiency of your shop, provide better working conditions for your men. Up to date in design, it will enable you to service 1937 cars as well as most older ones.

The final factor in waking up equipment earnings is your earnest effort to make your equipment, new and old, earn a profit. Shop equipment was never built to stand idle, to gather grease and dust. The more you use it, the fatter your bankroll grows. Aggressive selling will wake up equipment earnings.

*"She wants a ring job!"*

# *Wake Up* Parts Profits

REMEMBER the mental arithmetic problems we used to get in school? Well here's one to ponder over, and while the figures may seem big and bulky the answer is simple and easy. Easy, because your answer is the right one so far as your shop is concerned.

Here it is: Mr. and Mrs. J. Motoring Public of the U. S. A. spent $667,000,000 for replacement parts last year, according to authentic estimates. That dough kept cash registers ringing regularly in approximately 100,000 independent repair shops and car dealer service stations . . . which leads to one important conclusion and one equally important question. The conclusion: There's money in parts! The question: How much of it are you getting?

What was your share of last year's service business? What will be your cut out of the pie this spring and summer? Yes, your answer is correct, for you can get as much of this business as you are willing to go after.

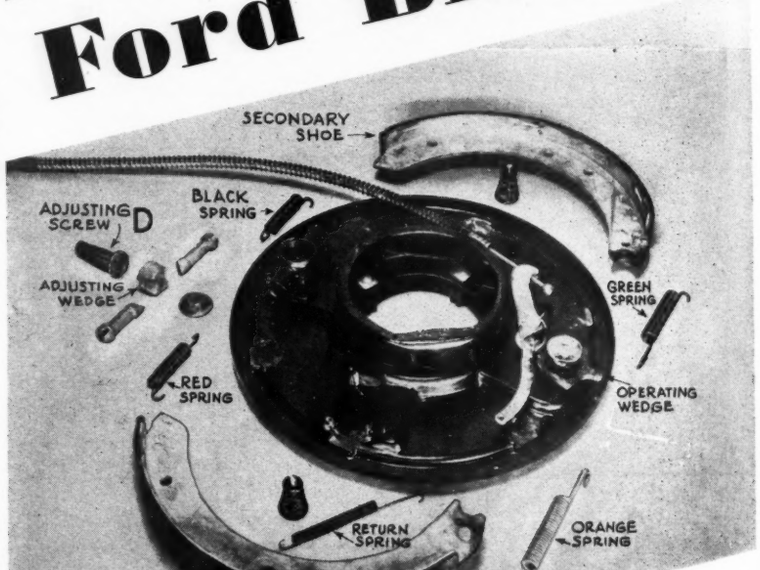
More than six hundred million dollars worth of replacement parts also represents an estimated expenditure of $1,670,000 for service labor paid by American car owners in 1936. Parts and labor together total more than two billion dollars, or an average volume of more than $20,000 per shop and service station.

These figures do not include the $3,944,000,000 spent for gasoline and lubricants last year, or the $324,000,000 that bought tires and tubes to keep America rolling in 1936. Altogether parts, labor, gas and oil, tires and tubes represent an estimated grand total of $6,605,000,000—twice as much as was spent on the purchase of new cars and trucks. The backbone of all this, insofar as the independent repairman is concerned is parts and labor.

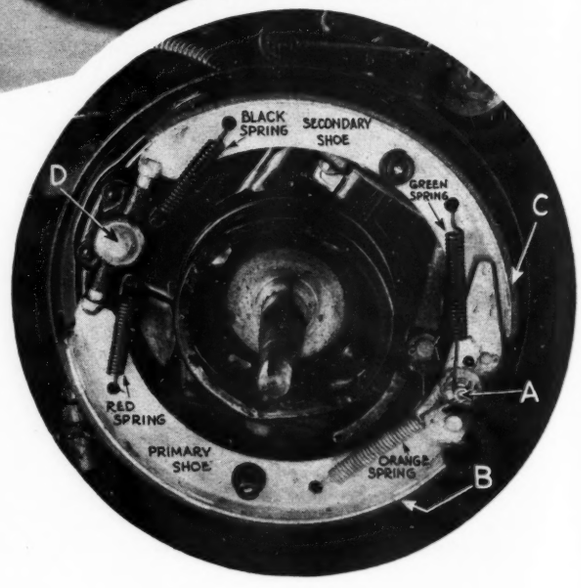
Parts are a part of your profit and to get a better share of this year's increasing volume there are two things to remember: Install new parts wherever necessary, pointing out to your customer that new parts are essential to satisfactory performance. Your customer will appreciate it, think more of your work and your profits will naturally pick up. Of course, there are certain parts that can and should be repaired rather than discarded. That's why valve refacers and other types of bench equipment were made. But, repair or replace—there's money in parts for you.

Details of the eccentric anchor are shown at the right

# Adjusting Ford Brakes




## A New Method Developed by Chilton Editors for Major Adjustments on 1937 Ford Brakes




IN the December issue of MOTOR AGE we gave the Ford factory's method of adjusting the brakes on the 1937 Ford cars. This involves the use of a special gage or dummy drum so that .005 in. clearance is obtained between the lining and the drum. The Ford factory advises that the eccentric should not be adjusted, and when the clearance is not .005 in., or when the brakes need relining, the backing plate and shoe assemblies should be exchanged for another set.

Realizing that many shop men would attempt to adjust the eccentric anchor pin and also reline Ford brakes in their own shops, the editors of MOTOR AGE have evolved the following method of adjusting these brakes, without the necessity of using any equipment. However, it must be pointed out that the use of a dummy drum, or a brake concentricity gage, would greatly facilitate the adjustment. The MOTOR AGE procedure is as follows:

After jacking up all four wheels and releasing the hand brake, inspect king pins, shackle studs, shock absorber links and radius rods for wear or looseness. Then disconnect brake cables at cross shaft. Loosen eccentric lock nut A. Insert plug wrench in anchor pin and with wheel rotating, turn wrench to left, until slight drag is felt. Then turn wrench in opposite direction until drag is felt. Then turn wrench to a point midway between these two positions. The lining clearance at B now should be the same as at C.

Remove wheel, making sure that eccentric adjustment does not change. Place a 12 in. strip of .005 in. shim stock on brake lining between points B and C and replace drum. Still making sure that eccentric setting at anchor does not change, run adjusting screw D in, until shoes are expanded in drums. Then tighten anchor lock nut A, making sure

*(Continued on page 80)*

# *Wake Up* Tired Tools

THE wrench with the sagging jaw . . . the toothless saw . . . the dull chisel . . . the lost, strayed or stolen socket wrenches . . . the buggered screw driver . . . these and other broken down, obsolete hand tools are the "tired tools" that must be repaired or replaced to make way for bigger profits this spring.

Constant changes in engine design and body construction of today's cars dictate the ever-increasing need for small tools in the up-to-date repair shop. Without the right types and sizes of small tools few repairmen can hope to give the kind of service the motoring public demands. Yet, put the right kind of tools in the hands of the skillful mechanic and you've got a combination that pays the "daily double" at any track . . . double on customer satisfaction and shop profits.

Tool-wise shop owners see to it that all necessary tools for every major job are available. Small tools are an investment in future profits, not an expense. They make tough jobs easier to handle, increase the efficiency and earning power of the individual mechanic, and are absolutely essential to good workmanship, good management and better profits.

When you invest in tools, here are three points to keep in mind—1. Check your tools inventory and see that sets are complete, junking the "tired tools" that have seen better days.—2. Know the tools you buy and who makes them, for it's unwise to buy tools of an unknown brand.—3. Buy tools that will enable you to give complete, up-to-date service on modern cars as well as old timers. Buy tools that are correctly designed, strong and sturdy, and tough enough to stand the workday gaff.

Tools can be bought on time payment plans, earning the monthly charges while they work for you. And the right tools will pay for themselves over and over again, in efficiency, customer satisfaction, and money in the bank.

A good mechanic is known by the tools he uses—and if you don't think so, ask the man who allowed a knuckle-buster to work on his car. That was a long time ago, because the customer doesn't go there anymore.

# Wake Up Accessory Sales

ONE means of increasing service station profits, not always appreciated by independent shop owners, is the sale of important accessories and supplies. More and more independents are learning the value of displaying accessories to attract the customers who drive in for gas and oil.

Accessories and supplies serve a twofold purpose for the serviceman. Not only do they aid in building a source of additional income and quick profit, but when properly displayed they add to the attractiveness of his station. Many successful operators believe that the most important factor in service profits is the plus sale, that is, the ability to give the customer what he wants and then sell him what he needs! Accessories and supplies enable you to do just that. A car owner may drive in for five gallons of gas but will seldom consider his other needs unless he is told or shown. If, by means of salesmanship, demonstration or display you are able to increase his order, that plus sale and other plus sales add extra dollars to your bank account.

Experienced accessory dealers give three secrets for successful merchandising of automotive accessories: 1. A stock of merchandise that is complete, kept clean and up-to-date. 2. An open display, attractively arranged "up front" where customers can see it. Call it the power of suggestion or anything else, the fact remains that once you get the prospect into your service station a display of accessories and supplies does half the selling job itself. 3. Capable handling of the department by men who are trained to sell accessories and supplies. Ofttimes these men can handle gasoline, accessory and service sales at the same time. Incidentally, local advertising is another important factor in the awakening of accessory sales.

American car owners spent $200,000,000 on automotive accessories and supplies and an additional $324,000,000 for tires and tubes, in 1936. A pile of dollar bills not to be sneezed at.

You can have a share of this market, benefiting by the increased contacts with car owners, by planning merchandise accessories this spring.

# Ten Billions Spent

## *U. S. Public Paid Out One-Sixth of Income on Autos In 1936; Nearly Two Billion Dollars for Maintenance*

Overwhelming importance of the automotive industry in the national economy was demonstrated again in the year 1936 when the American public paid over a sixth of the national income for its motor vehicles and the materials and services to keep them in operation.

The American motorists' bill in 1936 totaled $10,020,000,000 excluding amounts paid for vehicle and operating licenses, but including the enormous sums paid in taxes on gasoline, parts and motor vehicles themselves.

Over $2,630,000,000 was spent for the purchase of more than 3,500,000 passenger cars. More than $3,000,000,000 went for the purchase of 17,500,000,000 gal. of gasoline to operate the more than 28,000,000 vehicles now on American roads.

While the Department of Commerce has not yet published its national income figures for 1936, an official of the department informs MOTOR AGE that preliminary figures indicate that the amount produced and paid out for 1936 would be about the same as that for 1935—$60,000,000,000.

Below is a summary of how a sixth of this amount was spent by the public for automotive products.

### Summary of 1936

| | | |
|---|---|---|
| $2,630,000,000 | bought | 3,676,063 passenger cars (U. S. only) |
| 585,000,000 | bought | 778,462 trucks (U. S. only) |
| 3,404,000,000 | bought | 17,500,000,000 gal. of gasoline |
| 540,000,000 | bought | 540,000,000 gal. of lubricants |
| 324,000,000 | bought | replacement tires and tubes |
| 667,000,000 | bought | replacement parts |
| 200,000,000 | bought | accessories |
| 1,670,000,000 | bought | service labor |
| $10,020,000,000 | total 1936 bill to American motorists | |

### *"Regimentation," Says Ford, Assailing Labor Agitators*

Unionization of labor is regimentation and many of those who are leading the present strike agitation are "insincere," said Henry Ford in an interview copyrighted by the United Press. Mr. Ford made the statement at his winter estate at Ways, Ga.

"The labor unionization movement is really an effort on the part of financiers to kill competition and will keep down wages in the long run," Mr. Ford continued. "Laborers should never join unions because they have nothing to gain thereby. They are being regimented into something that will result to their detriment. Any man who has belonged to a union for some time can testify to that."

### Northwest Maintenance Show

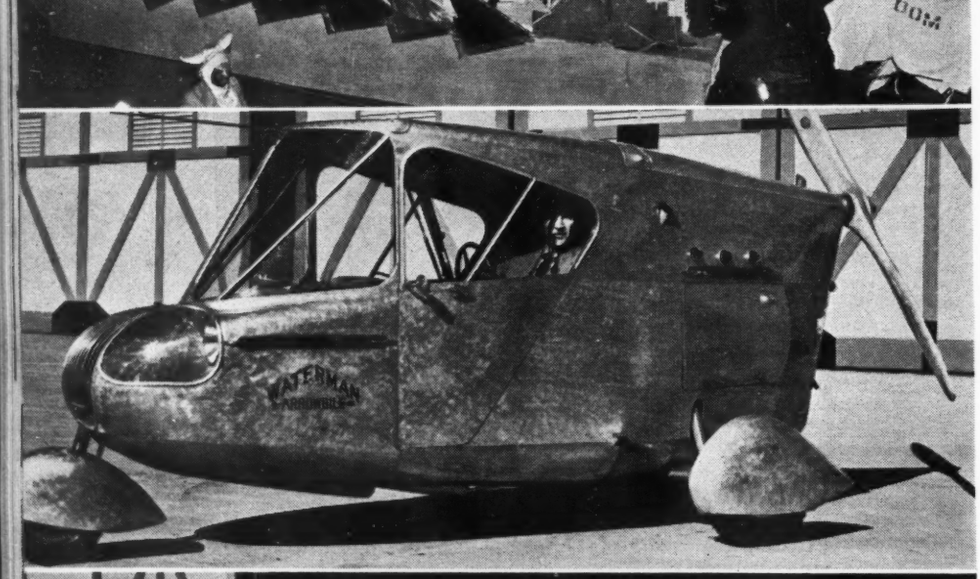
One hundred and fifty-three national manufacturers of automotive parts, supplies, equipment and accessories exhibited their products at the first annual Northwest Automotive Maintenance Show held at the Minneapolis Auditorium, April 8 to 11 inclusive.

### Down the Column:

**Stop-Go "Dolby"** The gentleman from London is wearing something new in hats, a safety-first bowler fitted with miniature traffic light signals which signal either red, amber or green to warn motorists that he has made up his mind to stop or go. We can't figure out what he does when his amber light is on—maybe he's just marking time!

**Pretzel Peddler** One of those street scenes in New York—the lady pretzel vendor, a super-saleswoman, taking advantage of red-lighted traffic, sells her wares to hungry motorists

**Beauty and the Midget** Gertrude Niessen, Hollywood star, found her own solution to the taxi problem in Chicago recently. Miss Niessen, who races midgets on the West Coast, used one to commute between her hotel and the night club where she was appearing. Her publicity man can probably explain how she drives in traffic without license plates



## *ASI Show Committee Sets Date For 1937 Exhibit*

The 1937 Automotive Service Industries Show, jointly sponsored by M.E.W.A., M.E.M.A., and N.S.P.A. will be a six-day event, Monday, Dec. 6, through Saturday Dec. 11 at Navy Pier, Chicago. This was decided at the first meeting of the Joint Operating Committee held at the Palmer House, Chicago, March 12.

Chairmanship of the Joint Operating Committee was awarded to W. F. Wilkerson, Wyoming Automotive Co., with J. M. Spangler, National Carbon Co., Inc., vice-chairman. A. B. Coffman, Chicago, again serves as show manager, and Herbert C. Buckman of Cleveland repeats as secretary of the committee.

Committee members are as follows:

*For M.E.W.A.:* W. F. Wilkerson, chairman, Wyoming Automotive Co., Casper, Wyo.; H. D. Dinkmeyer, Chicago Auto Parts, Inc., Chicago, Ill.; B. J. Oppenheimer, Faeth Company, Kansas City, Mo.; A. L. Treitman, American Motor Specialties Co., Newark, N. J.

*For M.E.M.A.:* J. M. Spangler, vice-chairman, National Carbon Co., Inc., New York, N. Y.; Malcolm McCormick, Walker Manufacturing Co., Racine, Wis.; Clyde P. Brewster, K-D Manufacturing Co., Lancaster, Pa.; C. C. Secrist, Victor Mfg. & Gasket Co., Chicago, Ill.

*For N.S.P.A.:* S. J. Levy, W. Bergman Company, Buffalo, N. Y.; C. W. McDaniel, Fostoria Pressed Steel Corp., Fostoria, Ohio; R. D. Black, Black & Decker Mfg. Co., Towson, Md.; A. E. Pouliot, National Bushing & Parts Co., Minneapolis, Minn.

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**Safety Awards Made**

New York City was awarded the grand prize in the Fifth National Safety Contest conducted last year by the National Safety Council. In the opinion of the judges "it came nearest to doing for traffic safety the maximum that practically could be done in that city."

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**Down the Column:**

**Types** **Two contrasting types of motoring shown at Palm Springs, Calif., when the lady in the Chevrolet met the charmer on her one-cylinder "putt-putt"**

**Myths** **Mobile's picturesque Myth Carnival, sponsored by ancient Order of Myths, held its carnival recently. Floats were illuminated by sixty Exide Hycap Batteries**

**Hybrid** **The two lower photos show Waldo Waterman, airplane designer, with his new combination automobile and airplane. It enables air motorists to fly to the airport, park their wings and drive to town**

# *Is Detroit Really Unionized?*

How far will unionism go in the automobile industry? Is Detroit about to be strongarmed into a closed shop city? These are questions frequently heard during the conflict between employers and organized labor which has made Detroit its principal battleground for many months.

The apparent strength of the United Automobile Workers' Union, the New Deal's promotion of union interests and the succession of strikes that have harassed the automobile manufacturers quite naturally have led to the conclusion that the industry is thoroughly organized.

Unbiased observers are convinced, however, that membership in unions still represents only a minority of the automobile workers. In their opinion, the recent tidal wave of unionism has reached its crest and evidence already has appeared that it has begun to recede. Union buttons are coming off the coat lapels of workers.

Chester M. Culver, general manager of the Detroit Employers Association, declared: "Union membership in the automobiles industry has reached its peak, and I believe that every forward-looking employer will agree with this view." A well-known union leader, not connected with the UAW, says: "I am expecting any day that the bubble will burst."

Mr. Culver, in his 34 years connection with the Employers Association, has seen several union movements rise and fall. Samuel Gompers was in Detroit three times to inaugurate organization campaigns. William Green came twice. Culver saw the unions make rapid progress in the industry during the war when, inspired by patriotism and a desire to cooperate with the War Labor Board, employers readily signed agreements with the unions. The industry, at that time, was nearly as well organized as now. But the unions were unable to hold their membership. Again in 1933, after the President's agreement with the automobile manufacturers, the AFL attempted another drive. A year later, however, when the Labor Relations Board polled workers in all automobile plants, the union was found to have a pitifully small minority.

Admittedly the present campaign has been easily the most successful. Aided by their new implement, the illegal sit-down strike, the unions have herded large numbers of unwilling proselytes into their fold. By means of the sit-down, the union has been able to close plant after plant although, when the strikes were called, it controlled only a small percentage of the total workers in these plants. Once the strike was started, many employes

(*Continued on page* 78)

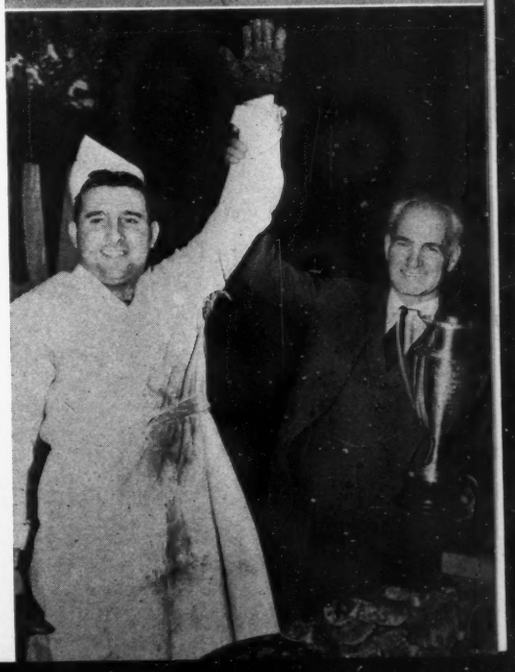
## *Three Italian Cars at Roosevelt Course July 5*

Three Alfa Romeo cars, one of which will be driven by Nuvolari and the two others probably by Brivio and Farina, will be sent to the Roosevelt Raceway for the Vanderbilt Cup race on July 5. French drivers are protesting the change of date from September to July, claiming that this change is contrary to international regulations. French drivers will have to choose between their own Grand Prix and the American race. Both Mercedes and Auto Union claim that the new date makes it impossible for them to race in America.

The Ferrari racing organization has announced that Nuvolari will not be sent to Indianapolis.

## *Bendix Sales Convention At South Bend May 25-28*

Announcement that the annual sales convention of the Bendix Products Corp. will be held in South Bend, Ind., May 25-28 has been made by Frank B. Willis, vice-president in charge of sales. More than 600 Bendix distributors are expected to attend the convention, coming from all parts of America and Canada.

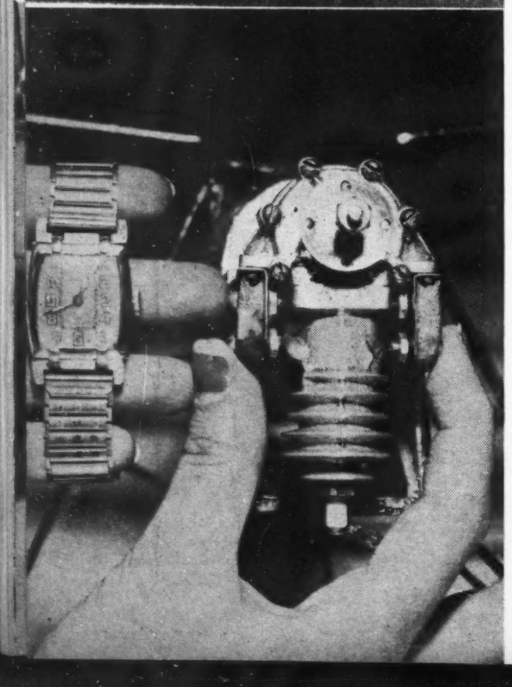


**Down the Column:**

**Coronation Fun** **Lord Strabolgi, British peer, tries out an electric bumper car, while Lady Strabolgi and Mr. T. R. Groves, M. P., look on. This is one of the attractions for the people's playgrounds during the Coronation festivities in England this spring**

**Gone with the Winter** **The warmth of spring has ended most of the winter sports but the inventive spirit never dies. Here is one, an ice-bicycle, driven by an air propellor, fitted with skates and a comfortable seat, and guided by bicycle handlebars**

**"Shucks" said DePalma,** **"I could make better time than that," as he awarded the cup to Manuel Tavares, who won the oyster shucking championship or something, in New York. Ralph was time keeper waving the checkered flag on Tavares who shucked a hundred oysters in less than five minutes**



## *Ring Around the U.S.A.*

Chevrolet's second annual safety and economy test run has just been completed after more than 10,000 miles under arduous driving conditions.

The run was made in a standard half-ton commercial car selected from the regular Chevrolet assembly line at Flint, Mich., under supervision of the A.A.A. Contest Board.

The driver was Harry Hartz, famous for his automobile racing exploits. With him went Stanley Reed, veteran watchdog of A.A.A. standards, to keep a check on the various records established on the test run.

The truck was driven along the northern boundary to the winding mountain passes of the Pacific Northwest, then south into California, east from Los Angeles to Jacksonville, down to Miami, then back north along the Atlantic coast to Boston, west again through New York State and back to Detroit by way of Cleveland.

The log showed a total of 10,244.8 miles at the conclusion of the run after less than 14 days of actual running time.

Here is a list of the records established: Mileage, 10,244.8; gasoline used, 493.8 gallons; oil consumed, 7.5 quarts; gasoline cost, $101; gasoline mileage, 20.74 miles per gallon; average speed, 31.18 miles per hour; running time, 328 hr. 31 min.; cost per vehicle mile, $0.0098; average oil mileage, 1365.9 miles per quart; total cost for parts replacements, $0.73.

One quart of water added at the conclusion of the test run brought the radiator up to full.

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**Bendix Prizes**

Total prize money for the 1937 Bendix transcontinental speed dash will be $25,000 it has been announced. The Bendix race will be flown from the West Coast to Cleveland this year on Sept. 3. There will be separate prizes for feminine pilots and a cash bonus for any pilot who continues on beyond Cleveland.

## There's No Other Way

*By Dr. Virgil Jordan*

"The prosperity and security of all the people in this country have come and can come only out of the work they do. The amount of prosperity and security they can have at any time depends solely upon the combined effort of mind and muscle which they are willing and able to apply in using the natural resources of the country to produce the necessaries and comforts they consume and exchange, and the tools and machines they need in order to produce as much or more in the future. The more work everyone does, the more people there are who work, the harder and longer and more effectively they work, the more prosperous and secure they will be. There is no other way."—*Shining Lines.*

## *GM to Hold Two Sessions of Summer Automotive School*

Applications are now being received at the General Motors Institute in Flint, Mich., for the fifth annual summer session for teachers of automotive mechanics in high schools and colleges, according to an announcement by Major Albert Sobey, director of the institute. Because of demands evidenced in previous years, there will be two identical sessions of four weeks each this summer.

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**Service Reporter**

Service Reporter, a new monthly publication, is now being issued by the Chrysler Corp. for service managers of Plymouth, Dodge, DeSoto and Chrysler dealers.

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**Down the Column:**

**Thumb Fun** **Charter members of "The National Intercollegiate hitchhikers Association" give a demonstration. They are students of the Long Beach, Calif. Junior College who formed the association. Members will be given a card of identification which is to be held up in plain sight of the motorist as the hitchhiker wiggles his thumb.**

**Some Speed** **Ernest Henne recently broke motorcycle speed records when he drove his new streamlined cycle at a speed of 272.2 km. per hour (169.7 m.p.h.) in Berlin recently. The rider does not sit in the streamlined hull but lies in it, in order to save room and to comform to the streamlined shape of the cycle**

**Some Engine** **This tiny gasoline engine of the Hanson Speedster model plane is no larger than a wrist watch but is said to be able to keep the miniature plane in flight.**

## *Stebbins Heads Eastern Midget Racing Circuit*

Midget racing under the sponsorship of the National Midget Auto Racing Circuit, newly formed organization, will begin during the third week in May and will continue through to Oct. 16.

The idea of the circuit was conceived by Walter C. Stebbins, of New York, promoter of the world's championship races held at Madison Square Garden Bowl last summer. Beginning with a four-night circuit consisting of Madison Square Garden Bowl, Philadelphia Stadium, Providence and Boston, interest of other leading promoters in the East was shown in the plan and at the present time, ten race meets will be conducted each week by the circuit. Besides the four original tracks in the loop, Freeport, N. Y., will operate two nights a week, and one night each has been allotted to the Philadelphia Yellow Jacket Speedway, New Haven, Bridgeport and Reading. Prize money totaling $8,000 each week will be the attraction which will lure drivers from all parts of the country.

(*Continued on page 84*)

## *Germans Will Try for World Record Next Year*

Germany will attack the world's land speed records at present held by Sir Malcolm Campbell, during the summer of 1938. A car for this purpose is now being designed by Dr. Ferdinand Porsche, the engineer responsible for the Auto Union racing cars.

The German record breaker will be completed before the end of the present year and will undergo preliminary trials on one of the new German motor roads. The record runs, however, will be made on the Bonneville Salt Flats in 1938.

All details regarding the car are being kept secret. All that Dr. Porsche would reveal to a representative of MOTOR AGE was that the car would be much smaller and lighter than the Rolls Royce job used by Campbell.

**Down the Column:**

**Tiny Tim** The appearance of this midget delivery van caused quite a sensation in London, recently. The truck can do 45 m.p.h. and travels 80 miles on a gallon of gas, it is said

**Horror Parade** Four hooded horsemen headed the Horror Parade in Atlanta, Ga. recently. To point out the frightful toll of traffic recklessness a macabre procession of coffins, wrecked automobiles, and funeral bands was exhibited

**Far North** A glimpse of a repair shop in the little town of Blue Ridge, Alberta, Can. Operated by R. W. Hodgson, a reader of Motor Age, it is the maintenance center in that section of the north country

## *Black & Decker Names Schreiner, Detroit Manager*

The Black & Decker Mfg. Co. announces the appointment of John M. Schreiner as manager of their Detroit branch, succeeding the late George W. Stoiber. John Schreiner has been active in the Detroit area for the past twelve years.

W. J. Fenwick, who for the past several years has been co-manager of the Cleveland territory, has been appointed manager of all activities in that branch.

G. H. Treslar has been appointed supervisor of the Detroit and Cleveland territories and will cooperate with Schreiner and Fenwick in the promotion of sales in these areas.

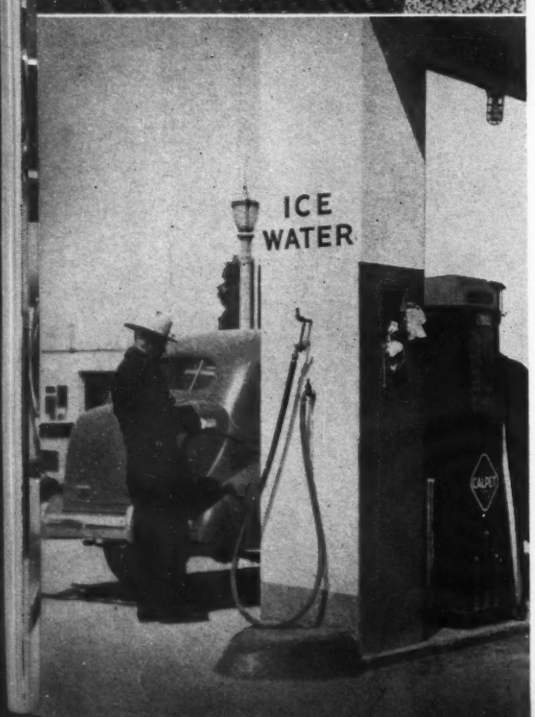
## *American Competition Asked At French Grand Prix*

An invitation by the Automobile Club of France has been extended to American motor car manufacturers through the Contest Board of the American Automobile Association to participate in the thirty-first annual Grand Prix of France to be held on the Linas-Montlhéry 12 Km. road circuit near Paris on July 4, 1937. The race is over a total distance of approximately 312 mi. and is limited to cars of the "sport category" which must comply in general respects with regularly catalogued models.

Although considerable freedom is allowed with regard to the design of the internal component parts of the engine, a reasonable weight requirement will be enforced in proportion to the engine size. Fuel for all cars is to be furnished by the sponsors of the race and will have an octane so-efficient of 81. A minimum qualifying speed of 75 m.p.h. for one lap of the course is made a requisite to starting.

### "Independent" for Tire Dealers

The first issue of Independent, a new monthly house magazine issued by U. S. Tire Dealers Mutual Corp., in the interests of the independent tire merchants of America, has been released.




### Please Note

**Pages 33 to 64 inclusive of this issue are represented by the 1937 Tune Up Manual. The manual, however, is marked from page 1 to 32.**

# Coming Events

## SHOWS

Illinois Automotive Ass'n, 4th Annual Show and Maintenance Exhibit, Navy Pier, Chicago .....Apr. 24-28
Second Annual Automobile Maintenance Show, San Francisco..May 20-23
National Automobile Show, New York, Oct. 27-Nov. 3
Buffalo, N. Y., Auto Show..Oct. 30-Nov. 6
Cincinnati Auto Show .....Oct. 31-Nov. 6
Chicago Auto Show .....Nov. 6-13
Akron Auto Show .....Nov. 6-12
Brooklyn Auto Show .....Nov. 6-13
Columbus Auto Show .....Nov. 6-13
Detroit Auto Show .....Nov. 6-13
Kansas City, Mo., Auto Show..Nov. 6-13
Newark, N. J., Auto Show.....Nov. 6-13
Philadelphia Auto Show .....Nov. 6-13
Pittsburgh, Pa., Auto Show ....Nov. 6-13
Toronto, Ont., Auto Show.....Nov. 6-13
Baltimore, Md., Auto Show.....Nov. 13-20
Cleveland, Ohio, Auto Show....Nov. 13-20
Jersey City, N. J., Auto Show..Nov. 13-20
Milwaukee, Wis., Auto Show...Nov. 13-20
Springfield, Mass., Auto Show..Nov. 14-20
St. Louis, Mo., Auto Show.....Nov. 14-21

## CONVENTIONS

National Battery Manufacturers Asso., Spring Convention, Shoreham Hotel, Washington, D. C. ..May 13-14
American Petroleum Institute, Mid-Year Meeting, Colorado Springs, Colo. .....June 1-3
Automotive Engine Rebuilders Association, 15th Annual Convention, Chicago .....June 21-24

## INTERNATIONAL RACES

Indianapolis Speedway, 500-Mile International Sweepstakes .....May 31
31st Annual Grand Prix of the Automobile Club of France, Linas-Montlhéry .....July 4
Pan American Cup Race, Roosevelt Raceway .....July 5
National and International Soap Box Derby Finals, Akron, Ohio....Aug. 15
Roosevelt Raceway, 400-Mile George Vanderbilt Cup Sweepstakes...Sept. 6
Los Angeles, 500-Mile International Sweepstakes .....Nov. 28

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**Down the Column:**

**Femininity in Grease** She is Grete, the first female mechanic in Austria. Seventeen years old, Grete is considered an expert in her work and can crawl under with the best of them

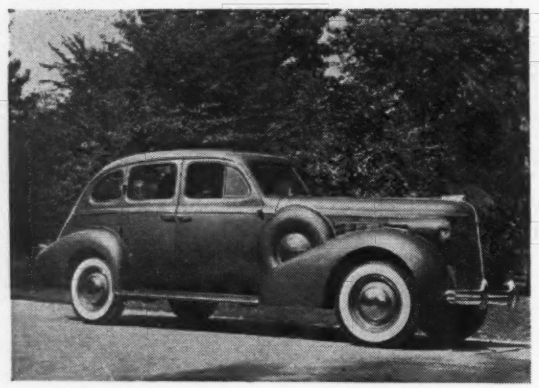
**How Far? Press the Button** Correct mileage with just the press of a button. Hugh Williard (left) of the Automobile Club of Southern California shows C. W. Bloom (right) DeSoto regional manager how the "distance calculator" works. The operator presses the name of a destination city, red and green lights flash and the correct mileage figure lights up on the panel

**Free Ice Water** One of the greatest helps to summer business in the hot, arid reaches of the southwest, according to C. A. Schafer of Schafer-Norton Co. in Tucson, Ariz., is real ice water. It's another free service at this station that both natives and tourists lap up

# 1937 Tune-Up Manual

By BILL TOBOLDT

# Buick



**Model 37-40**

### Engine

Starting Engine No. 4-3166225, Serial No. 2999497. Eight cylinder, valve-in-head, 3 3/32 x 4⅛ in. Firing order, 1-6-2-5-8-3-7-4. Compression ratio, 5.70 to 1. Compression pressure 120 lb. at 1000 r.p.m.

### Carburetor

Stromberg AA-1, duplex downdraft, 1 in. Idle adjustment—turn idle adjusting screw OUT for rich mixture, IN for lean. Separate adjusting screw for each barrel of carburetor. Standard setting is 1⅜ turns out from seat. Accelerating pump is provided with two settings—use upper hole for ordinary fuels. Main metering jets are not adjustable. Fuel level ⅝ in. below top surface of float chamber, or level with bottom of sight hole in side of float chamber—check with engine running. Calibration — main discharge jet No. 28-No. 36. Main metering jet .049 in. Special. By-pass jet No. 66. High speed bleeder No. 70. Float needle seat .093 in. Special metering jet and by-pass jet supplied for high altitude or for use with heavy duty air cleaner.

### Distributor

Delco-Remy Model 663-Y. Automatic advance with vacuum control. Single breaker arm. Point gap .015 in.

### Ignition Timing

Clean and adjust breaker points to .015 in. gap. Set distributor so that No. 1 cylinder fires when "Adv." mark on flywheel lines up with mark at timing hole in right side of flywheel housing. Pointer index line should be set opposite center line on scale. Ignition occurs 2 deg. or ¾ flywheel tooth before top dead center.

### Spark Plugs

Standard equipment AC 18 mm. type H-9. Proper gap is .025 in.

### Valves

Operating tappet clearance, intake .015 in., exhaust .015 in.

### Valve Timing

Set No. 1 valve tappets to .015 in. clearance. Intake valve opens 13 deg. or 5¼ flywheel teeth before top center, and exhaust valve closes 22 deg. or 8¼ flywheel teeth after top center. To check setting, place a dial indicator on the exhaust valve spring cap of No. 2 cylinder with valve lashed to .015 in. clearance. Crank engine until valve has opened .145 in. and the No. 1 and 8 T.D.C. mark on flywheel should be visible through timing hole in right side of flywheel housing. When installing timing chain, copper plated washers on chain should be in line with marks on cam and crank sprockets. Copper plated washers are 10 links apart.

### Connecting Rods

Remove from above. Centrifugal cast babbitt bearings, adjustable by removing shims. Install with marks on rod and cap pointing toward rear of engine. Piston pin clamped in rod. Bearing clearance .0008 to .0018 in.

### Generator

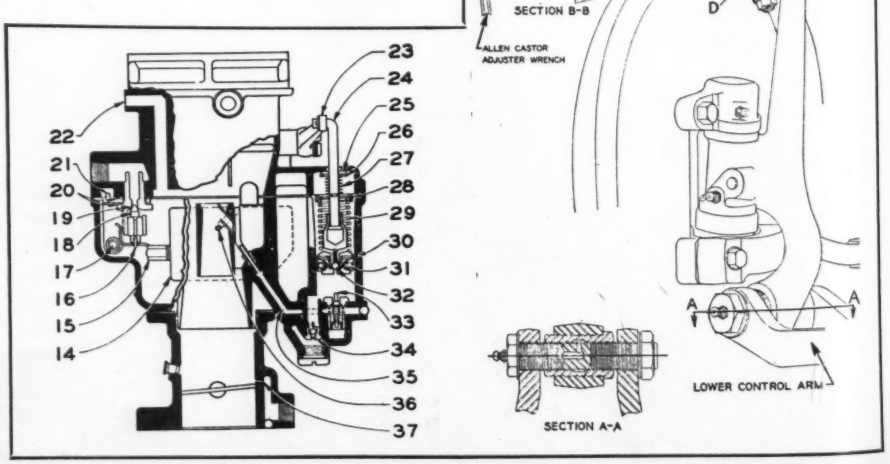
Delco-Remy Model 918-B. Non-adjustable third brush type, with output controlled by voltage regulator. Maximum output 26 amperes hot, at 7.5 volts. To check output, disconnect wire from "IGN" terminal of regulator. Disconnect wire from "BAT" terminal, and connect accurate ammeter in series between "BAT" terminal and wire removed from that terminal. Connect voltmeter between "GEN" terminal of regulator and to Ground. Speed engine up to 40 m.p.h. and adjust resistance until voltmeter reads 7.5 volts, and ampere output is 26 amps. If unable to reach this maximum, ground "F" terminal of regulator. If output increases it indicates dirty regulator contact points or loose connections. If no increase with "F" terminal grounded, it indicates a defective generator.

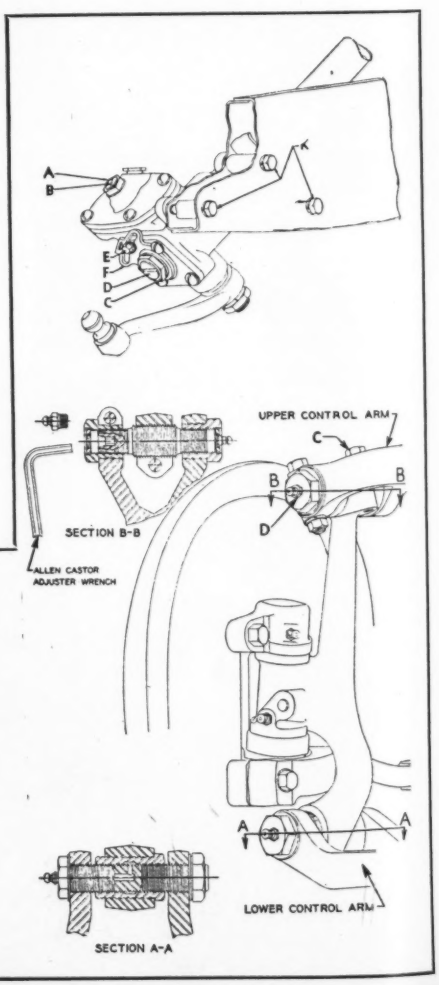
### Steering

Saginaw worm and double roller. Adjustments made with steering connecting rod disconnected at Pitman arm. To remove roller shaft end-play, first tighten four round head screws that hold side cover to housing. Loosen jam nut (A) and tighten adjusting screw (B) down tight by hand and then back off slightly and tighten jam nut. Turn steering wheel from one extreme to the other to be sure that there is no bind. To remove worm shaft end play, loosen lock nut (C) and tighten adjusting screw (D) until a slight load is felt on the steering wheel when turning, with the gear near extreme end positions. To remove back-lash between worm and roller, first be sure that the three round head screws holding the end cover to the housing are tight. Then center the steering wheel midway between extreme right and extreme left positions. Spoke having small dent on underside near hub should be straight down. Loosen lock screw (E) and lightly tap the lash adjuster (F) in direction of arrow. Check for tight spot by turning steering wheel through center range. Load required to turn the gear through the center position should not exceed 1¾ lb. when measured with a spring scale at the steering wheel rim. Tighten lock screw (E).

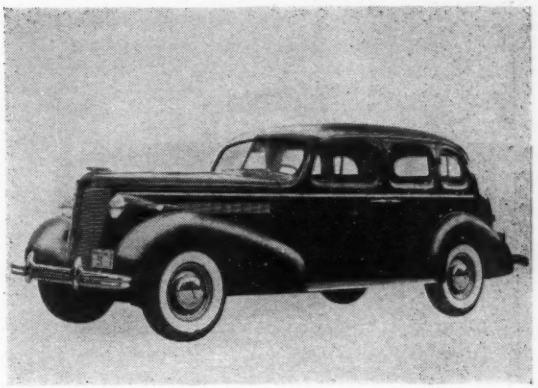
### Front Axle

Independent suspension. Caster ¼ deg. Camber ¼ deg. negative to 1 deg. positive. King pin inclination 3½ to 4½ deg. Toe-in 0 to 1/16 in. Tread 58 1/16 in. To adjust caster, jack up wheel and loosen clamp bolt in steering knuckle support arm. Remove lubricating fitting from head of threaded pin and turn threaded pin as required to secure proper caster, checking with a protractor held against machined bosses on steering knuckle support arm. Camber angle is not adjustable. To adjust toe-in, center wheels in straight ahead position and adjust each tie rod the same amount to secure proper toe-in.



# Buick



**Models 37-60, 80, 90**

## Engine

Starting Engine No. 3176225 (prefixed by 6, 8 or 9, indicating 60, 80 or 90), Serial No. 2999497. Eight-cylinder, valve-in-head, 3 7/16 x 4 5/16 in. Firing order 1-6-2-5-8-3-7-4. Compression ratio 5.75 to 1. Compression pressure 119 lb. at 1000 r.p.m.

## Carburetor

Stromberg AA-2, duplex downdraft, 1¼ in. Idle adjustment—turn idle adjusting screw OUT for rich mixture, IN for lean. Separate adjusting screw for each barrel of carburetor. Standard setting is 1¼ turns out from seat. Accelerating pump is provided with two settings—use upper hole for ordinary fuels. Main metering jets are not adjustable. Fuel level ⅝ in. below top surface of float chamber, or level with bottom of sight hole in side of float chamber—check with engine running.

## Ignition Timing

Clean and adjust breaker points to .015 in. gap. Set distributor so that No. 1 cylinder fires when "Adv." mark on flywheel lines up with mark at timing hole in right side of flywheel housing. Pointer index line should be set opposite center line on scale. Ignition occurs 10 deg. or 4 1/3 flywheel teeth before top dead center.

## Spark Plugs

Standard equipment AC 18 mm. Type H-9. Proper gap is .025 in.

## Valves

Operating tappet clearance, intake .015 in., exhaust .015 in.

## Valve Timing

Set No. 1 valve tappets to .015 in. clearance. Intake valve opens 14 deg. or 6 flywheel teeth before top dead center, and exhaust valve closes 25 deg. or 10¾ flywheel teeth after top dead center. To check setting, place a dial indicator on the exhaust valve spring cap of No. 2 cylinder with valve lashed to .015 in. clearance. Crank engine until valve has opened .155 in. and the No. 1 and 8 T.D.C. mark on flywheel should be visible through timing hole in right side of flywheel housing. When installing timing chain, copper-plated washers on chain should be in line with marks on cam and crank sprockets. Copper-plated washers are 10 links apart.

## Connecting Rods

Remove from above. Centrifugal cast babbitt bearings, adjustable by removing shims. Install with marks on rod and cap pointing toward rear of engine. Piston pin clamped in rod. Bearing clearance .0008 to .0018 in.

## Generator

Delco-Remy Model 918-A. Non-adjustable third brush type, with output controlled by voltage regulator. Maximum output, hot, 26 amperes at 7.5 volts. To check output, see instructions for Buick 37-40. To check operating of voltage regulator, disconnect wire from "BAT" terminal and connect ammeter in series between this wire and terminal. Disconnect wire from "IGN" terminal and connect voltmeter to this terminal and to ground. Clip a jumper wire to "IGN" and to "BAT" terminals. Set engine speed up to maximum charging rate and adjust resistance unit to show charge of 8 to 10 amps. Cycle regulator by bringing engine speed back to idle and then up to above charging rate. Voltmeter should read 7.4 to 7.6 volts if hot, or 7.5 to 7.9 volts at room temperature. Regulator cover must be in place when this test is made.

## Brakes

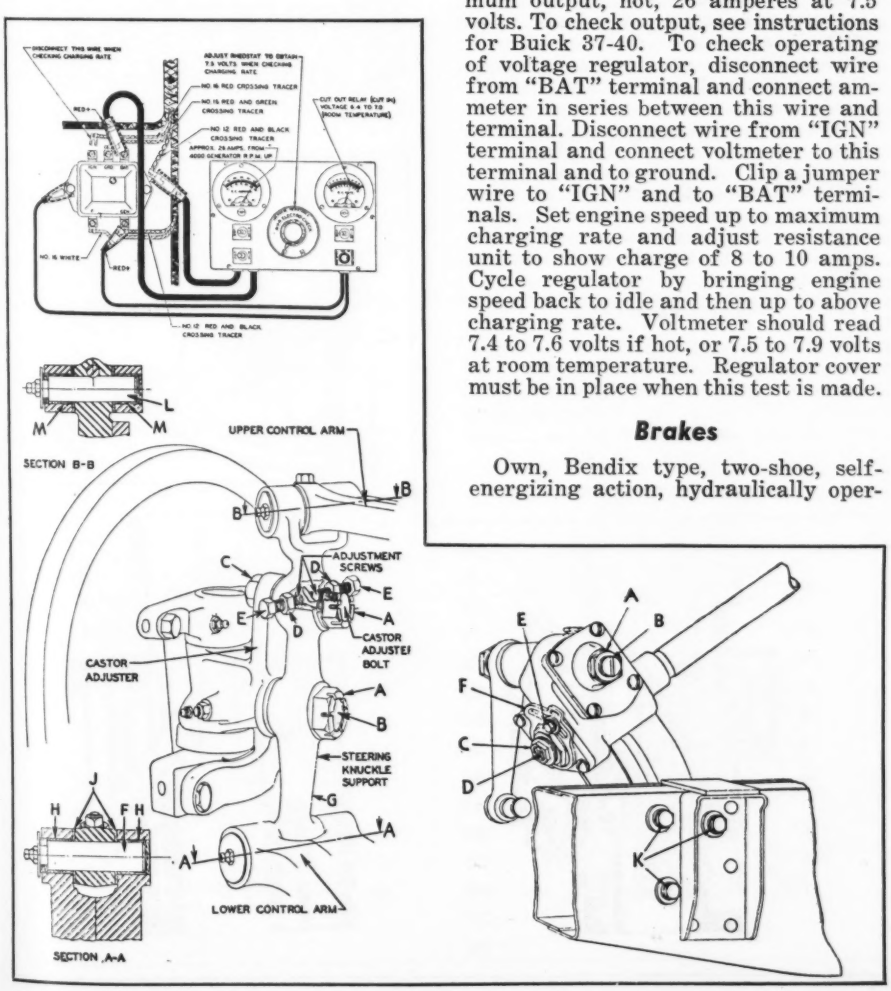
Own, Bendix type, two-shoe, self-energizing action, hydraulically operated, with mechanically operated hand brake on rear wheels for parking. Brake drum diameter, 60 & 80 Series, 12 in.; 90 Series, 14 in. Brake lining per wheel, 60 & 80 Series, 22 11/16 in. x 2 in. x 3/16 in.; 90 Series, 26 15/16 in. x 2 in. x ¼ in. To adjust, jack up all four wheels and disconnect hand brake cables at front end. Loosen eccentric lock nut and turn eccentric in direction of forward wheel rotation until there is a heavy drag on drum, then back off until drum is free of drag. Tighten eccentric lock nut. Adjust length of hand brake cables so that clevis pins will enter hole in lower cross member plate when spring tension is taken up. Then attach cables to equalizer bar, and adjust nut holding cable from hand brake lever to equalizer bar until slack is out of rear cables. Expand brake shoes by turning notched adjusting wheel until brake drum can just be turned by hand, then back off 17 to 20 notches. Adjust brake pedal to have ⅜ in. clearance at under side of toe-board, and ½ to ¾ in. free travel measured at pedal pad.

## Steering

Saginaw worm and double roller. For adjustment see instructions under Buick Series 40.

## Front Axle

Independent suspension. Caster, Series 60, ⅛ deg. negative to ⅝ deg. positive; Series 80 & 90, ⅜ deg. negative to ⅜ deg. positive. Camber, ¼ deg. negative to 1 deg. positive. King pin inclination, Series 60, 3½ to 4½ deg.; Series 80, 4¼ to 5¼ deg.; Series 90, 4 to 5 deg. Camber angle is not adjustable. Caster adjustment of Series 60 is same as Series 40. To adjust caster of Series 80 & 90, jack up front wheels, loosen nuts "A" on upper adjuster bolt "C" and adjuster shaft "B" one turn. Loosen lock nuts "D" on adjusting screw "E." Back off rear adjusting screw "E" and tighten front adjusting screw "E" to increase caster. One-quarter turn of caster adjusting screws changes caster ¼ deg. Adjustment of each side must be within ¼ deg. of each other. To read caster, hold protractor against machined bosses on caster adjuster. Toe-in, 0 to 1/16 in.



# Cadillac

**Models 60, 65, 70 & 75**

### Engine

Eight cylinder 3½ x 4½ in. Firing order 1-8-7-3-6-5-4-2. Standard compression ratio 6.25 to 1. Special compression ratio 5.75 to 1. Approximate compression pressures 105 and 95 lb. respectively, at cranking speed, wide open throttle and spark plugs removed.

### Carburetor

Stromberg AA-25. Adjustment — With engine warm, adjust idle stop screw 40 to obtain a speed of about 7 m.p.h. The idle needle valves 8, control fuel for low speed. Turn adjustment out for richer mixture. Taking one barrel at a time, turn the idle adjustment screw 8 in, until engine falters, then turn adjustment 8 out until engine begins to roll. Then turn in until engine runs smoothly. Then follow same proceedure on the other idle needle valve 8 for the other four cylinders. More fuel for maximum power is provided by economizer. Use long stroke of accelerator pump, for cold weather. Fuel level of ⅝ in. below the top surface of the float chamber corresponds to the bottom of the level sight plug with the engine idling. Level can be reset by bending the float lever arm at a point adjacent to the fulcrum pin. Distance between the top of the float and the gasket should be 1 13/32 in. Adjusting automatic choke thermostat—Remove thermostat case and allow thermostat D to cool to 70 deg. With thermostat at 70 deg., the inside of the hook H should coincide with the zero markings on the thermostat case. When installing new parts, check zero position very carefully at 70 deg. and change location if necessary. To adjust thermostat, reassemble case unto air horn so that the hook H comes into contact with pin on lever without any tension and with choke valve in wide open position. Zero marking on case will then coincide with notch on air horn. Revolve case 15 notches rich and fasten screws securely.

### Distributor

Delco Remy 665-G. 20 deg. manual advance, 22 deg. centrifugal alvance, no vacuum advance. Breaker points should be adjusted to .015 in.

### Ignition Timing

With breaker points cleaned and adjusted to .015 in., points should open 5 deg. or 2 flywheel teeth before top center. Or when IGN mark on balancer lines up with pointer. No. 1 cylinder is front cylinder on left bank.

### Spark Plugs

Standard equipment AC type K-7. Adjust gaps to .026 in.

### Valves

Valve tappet clearances are automatically adjusted. Noisy tappet action is invariably caused by dirty lifter mechanism, which can be corrected by washing in gasoline. After cleaning it is necessary to run the engine several miles before oil fills tappet mechanism and tappets become quiet. Both intake and exhaust valve springs have a pressure of 145 lb. at 1.58 in. length, and 66 lb. at 1.92 in. length. Intake and exhaust valve seat angle 45 deg.

### Valve Timing

Intake valve opens at top center and exhaust valve closes 10 deg. or 4 flywheel teeth after top center.

### Pistons

Bohn LoEx pistons. T-slot, annodized. Clearance at top land .025 in., clearance at skirt .0021 in. Fitted with four rings. Wrist pin diameter ⅞ in. Pistons are removed through the top of the block.

### Connecting Rods

Rod and piston assemblies are removed through the top of the block. Bearings are of the interchangeable steel backed babbitt type. Diameter 2.46 in., length 2 1/32 in. Clearance .0015 in.

### Main Bearings

Bronze backed babbitt interchangeable type. Clearance .0015 in.

Three main bearings 2½ in. in diameter. Length of front bearing 1 1/16 in., center 1 5/32 in., rear 1 31/32 in. End play .0030 in.

### Battery

Standard equipment Delco. Positive terminal grounded.

### Generator

Delco Remy. Models 8-60 and 8-65 equipped with Delco Remy model 918-C. Models 8-70 and 8-75 equipped with Delco Remy model 961-K. Maximum charging rate on model 918-C 28 amp. at 8.0 volts and 4200 r.p.m. Maximum charging rate on model 961-K 26.0 amp. at 1650 r.p.m.

### Starter

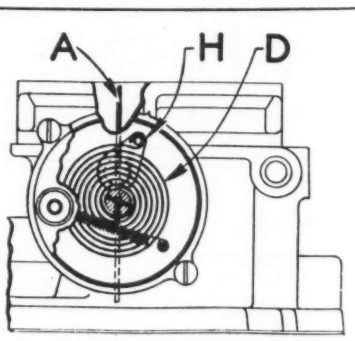
Delco Remy model 727-V-4p. Lock Torque 16 ft. lb. at 3 volts and 600 amp. Running free at 5500 r.p.m. at 5.0 volts and 65 amp.

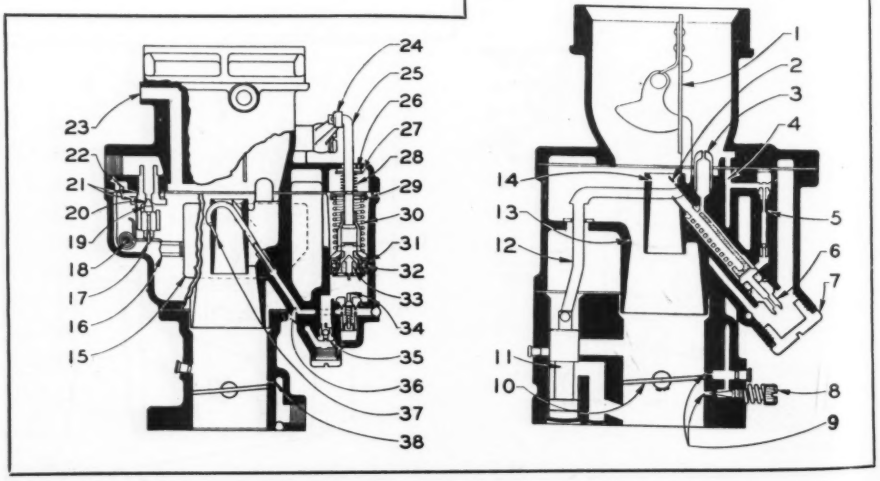
### Wheel Alignment

Caster zero deg. plus or minus ¼ deg. Camber 0 to ½ deg. Toe-in 0 to 1/16 in.

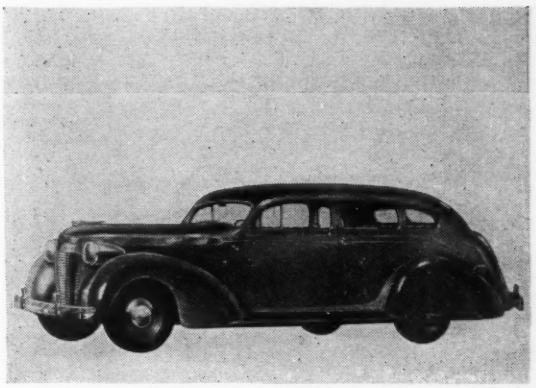
### Brakes

Hydraulic brakes operating in Centrifuse drums. Models 8-60, 8-65, and 8-70 have 12-in. drums using 25⅞ x 2 x 3/16-in. lining per wheel. Model 8-75 uses 14-in. drums with 30 x 2¼ x ¼-in. lining per wheel. Clearance at both heel and toe .010 in. To adjust —jack up all four wheels, loosen eccentric lock nut, and turn eccentric in direction of wheel forward rotation until .010-in. feeler gage is snug at either end of secondary shoe between lining and drum. Tighten lock nut. Expand shoes by notched adjusting wheel until drag is felt on brake drum. Adjust parking brake cable so clevis will just enter cross shaft lever. Then back off notched adjusting wheel until drums are free of drag.



# Chrysler



**Royal C-16**

### Engine

Engine number located on left side of cylinder block between No. 1 and No. 2 cylinder. Six-cylinder, 3⅜ x 4¼ in. Firing order 1-5-3-6-2-4. Compression ratio standard 6.50 to 1, optional 7 to 1. Approximate compression ratio 110 lb. and 120 lb. respectively.

### Carburetor

Carter carburetor Models E6K1, E6K2, E6K3, E6K4. Flange size 1½ in. S.A.E. Throttle bore 1 11/16 in. Main venturi 1 9/32 in. Idle orifice tube jet size .0276-in. drill. Idle passage air bleed .063 in. Economizer in body .049 in. Float setting top of float 5/64 in. below top surface of carburetor body casting. Accelerating jets, 2—.0354 in., 21/64 in. from end, and 2—.0354 in., 1 1/64 in. from end. Main metering jet calibrated to flow 282 to 286 cc. per minute. Step-up jet No. 63 drill. Set idle adjustment ½ to 1¼ turns opens. Turn out for richer mixture.

### Distributor

Auto Lite IGS-4010-1. Centrifugal advance 24 deg. Vacuum advance 22 deg. Breaker spring tension 18 to 20 oz. Breaker point gap .020 in.

### Ignition Timing

With breaker points cleaned and adjusted to .020 in. gap, points should open 2 deg., or 1 flywheel tooth or .002 in. of piston travel after top center, or when the ignition mark on the crankshaft impulse neutralizer lines up with the pointer on the timing case cover. If the throttle is suddenly opened wide, the mark on the impulse neutralizer should advance approximately 10 deg. when the engine speed reaches 25 m.p.h. If the throttle is then closed to maintain this speed, the mark on the neutralizer should advance another 10 deg.

### Spark Plugs

Standard equipment, Champion J-8. Correct gap .025 in.

### Valve Tappet Clearance

For operating, intake tappet should be adjusted to .008 in., and the exhaust to .010 in. with the engine hot.

### Valve Timing

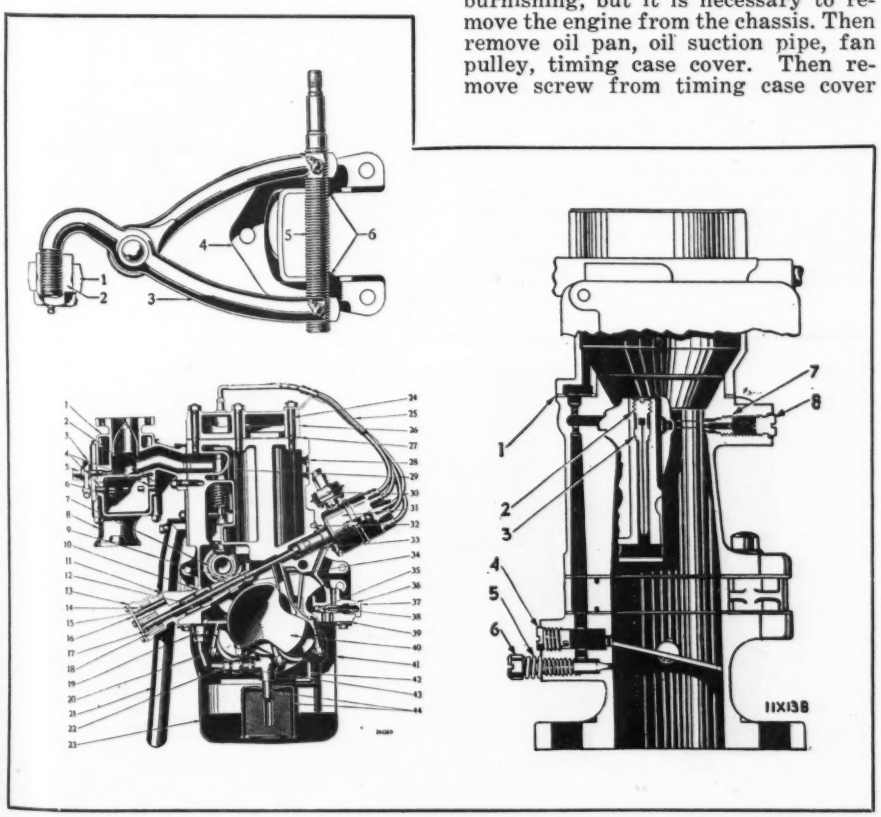
With intake and exhaust valve tappets set to .014 in., intake valve opens at top center, and the exhaust valve closes at 2 deg. or 1 flywheel tooth, or .002 in. of piston travel after top center. When installing a new timing chain, punch marks on crankshaft and camshaft sprockets should be brought together and in line with the centers of the shafts.

### Connecting Rods

Rods should be installed with the oil hole in the upper half of the lower bearing toward the valve side of the engine. Bearings are of the interchangeable type. Bearings should always be installed so the small boss on the bearing lines up with the grooves in the rods. Bearing clearance .0005 to .0025 in. End play .0055 in. to .0115 in.

### Main Bearings

Replacement bearing caps have stud holes 1/64 in. larger than standard and the caps are 1/16 in. shorter in length. This permits fitting the caps by shimming or filing. Bearings can be replaced without reaming, scraping or burnishing, but it is necessary to remove the engine from the chassis. Then remove oil pan, oil suction pipe, fan pulley, timing case cover. Then remove screw from timing case cover plate to oil pan front gasket oil seal plate, which will permit removal of front main bearing cap. Remove remainder of bearing caps. Bearings can then be removed by rotating crankshaft.



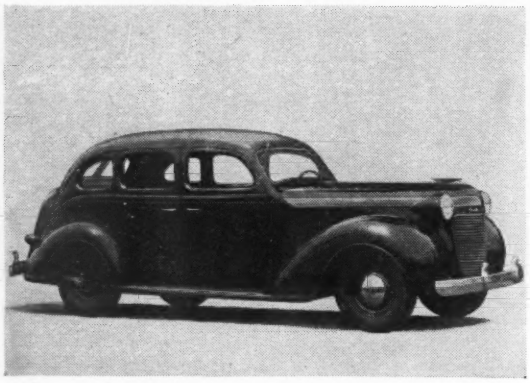

### Generator

Auto Lite Model GBW-4803-A. Two-brush shunt type, with current and voltage control. Without control unit output is 22 amp. at 8 volts and 1600 r.p.m. To test voltage regulator, connect accurate ammeter between terminal marked "B" and the lead removed from that terminal. Connect a voltmeter across the "B" terminal and the terminal marked "GD." Then with fully charged battery and engine running at approximately 30 m.p.h., and the generator warm, ammeter should read below the maximum noted on the name plate of the regulator and the voltage should be 7.4 to 7.8 volts. To check current regulator use the same connections and add an electrical load of a current value in excess of that noted on the nameplate of the regulator at a point between the car ammeter and the battery. If the current regulator is OK, the ammeter reading should be approximately the same as that noted on the nameplate.

### Wheel Alignment

The connection between the upper end of the vertical support and the upper control arm consists of a threaded eccentric bushing in the steering knuckle support which threads onto the threaded end of the upper control arm The eccentric adjusting bushing is secured by a clamp screw which is positioned at the upper end of the steering knuckle support and lies in a semi-circular groove on the outside of the bushing to prevent turning or fore and aft movement. The fixed caster angle is obtained by turning the eccentric bushing at the upper end of the spindle support until the setting of 1½ deg. caster is obtained. Camber adjustment is made within ½ revolution from the point where 1½ deg. caster setting is obtained. Toe-in should be measured at hub height. Long tie rod should measure 31 7/32 in. between ball centers. Then adjust short tie-rod to obtain a toe-in of 0 to ⅛ in.

# Chrysler



**Cust. Imperial C-15**
**Imperial C-14**

### Engine

C-14 8 cylinder 3¼ x 4⅛ in. Model C-15 8 cylinder 3¼ x 4⅞ in. Firing order 1-6-2-5-8-3-7-4. Compression ratios—C-14, 6.50 to 1 and 7.0 to 1. Model C-15, 6.7 to 1 and 7.4 to 1.

### Carburetor

Stromberg model AAOV-1. Idle tube No. 70 feed hole. Vacuum economizer by pass jet No. 56 hole. Metering jet .047 in. Main discharge jet No. 36. Pump by pass jet two No. 56 holes. Pump capaciay 27 to 31 CC. slow and 21 to 25 CC. fast per ten strokes in maximum adjustment. Fuel level ⅝ in. below top surface of the float chamber at 3 lb. pressure which corresponds to the bottom of the float level sight plug hole. Float level must be checked with the engine running. Idle adjusting screw 19 controls fuel. Turn out for richer mixture. Two positions are provided for accelerating pump. Use longer stroke for cold weather. Float level can be reset by bending vertical lip of float. When adjusting automatic choke, remove air cleaner and choke cover. Clamp adjusting tool in place so that pin in tool enters and lines up the holes in the armature and magnet core of the unit. Loosen choke arm clamp screw and while holding lever down, to remove back lash, set the choke valve in the closed position. Then tighten clamp screw. Before removing setting tool check the choke for back lash by pushing gently back and forth on the choke rod. There should be no back lash.

### Distributor

Auto Lite IGT-4001-F1. Full automatic advance. Centrifugal advance 22 deg., vacuum advance 14 deg. Breaker point gap .018 in.

### Ignition Timing

Model C-14. Breaker points should open when 3 deg. or .004 in. of piston travel after top center. Crankshaft pulley marked in degrees. Model C-15. Standard head—points should open 5 deg. or .012 in. of piston travel after top center. Special 7.4 to 1 head. points should open 9 deg. or .038 in. of piston travel after top center. Crankshaft pulley marked in degrees. With neon type timing light directed against crankshaft pulley and engine idling, timing pointer should line up with degree mark specified. If throttle is opened wide suddenly, mark on pulley should advance approximately 10 deg. when engine speed reaches 25 m.p.h. If throttle is closed to maintain this speed, mark on crankshaft pulley should advance another 10 deg.

### Spark Plugs

C-14 and C-15, Standard equipment. Champion H-10, 14 mm. Correct gap .025 in.

### Valve Tappet Clearance

With engine hot, intake tappet should be adjusted to .006 in. and exhaust to .010 in.

### Valve Timing

With intake tappets adjusted to .011 and exhaust to .014 in., intake valve should open 2 deg. before top center and exhaust closes 4 deg. after top center. Crankshaft pulley is marked in degrees. When installing timing chains, punch marks on crankshaft and camshaft pulleys should be brought together and in line with the centers of the shafts.

### Connecting Rods

Rods should always be installed with the oil squirt hole on the valve side of the engine. Bearings are of the interchangeable type. When installing bearings be sure the small boss on the bearings lines up with the groove in the rod and rod cap.

### Main Bearings

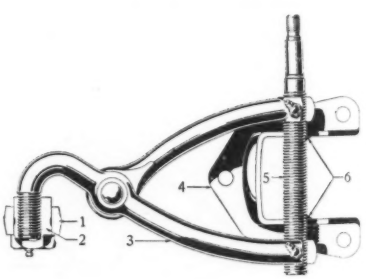
Main bearings are of the interchangeable type. To replace bearings it is first necessary to remove engine. Then remove oil pan and oil suction pipe, fan pulley and timing case cover. Then remove screw from timing case cover plate to oil pan front gasket oil seal plate which will permit removal of front main bearing cap. After removing bearing caps, bearing shells can be removed by rotating crankshaft.

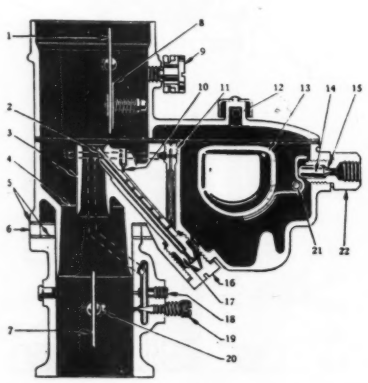
### Generator

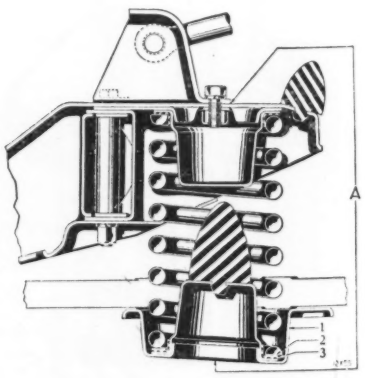
Auto Lite GCO-4801-C. Two brush shunt type, with current and voltage control. Without control unit, output is 28 amp. and 8 volts at 1700 r.p.m. To test voltage regulator, connect accurate ammeter in series between terminal marked "B" and the lead taken from that terminal. Also connect a voltmeter across the "B" and "GD" terminals. Then with a fully charged battery and engine running at 30 m.p.h. and the generator warm, ammeter should read below the maximum indicated on the name plate of the regulator and the voltage should read between 7.4 and 7.8 volts.

### Wheel Alignment

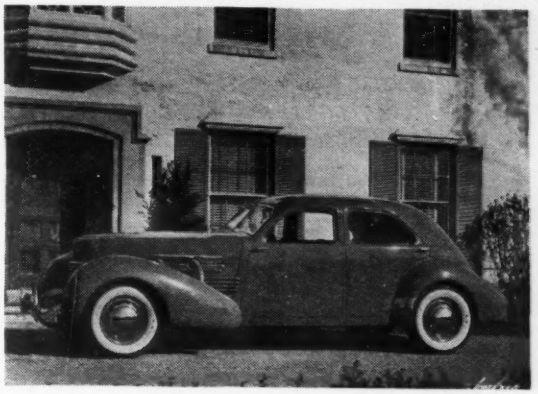
The connection between the upper end of the vertical support and the upper control arm consists of a threaded eccentric bushing in the steering knuckle support which threads onto the threaded end of the upper control arm. The eccentric adjusting bushing is secured by a clamp screw which is positioned at the upper end of the steering knuckle support and lies in a semi-circular groove on the outside of the bushing to prevent turning of fore and aft motion. The fixed caster angle is obtained by turning the eccentric bushing at the upper end of the spindle support until the setting of 1½ deg. caster is obtained. Camber adjustment is made within ½ revolution from the caster setting. Camber should be from minus ¼ deg. to plus ½ deg. On C-15 both tie rods should be the same length. On C-14 long tie rod should be adjusted to 30 15/16 in. Correct toe-in 0 to ⅛ in.



# Cord

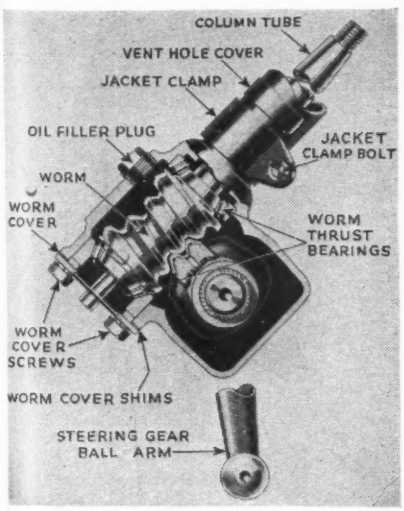


### Engine

Eight cylinder 3½ x 3¾ in. Compression ratio 6.32 to 1. Compression pressure 110 lb. at 130 r.p.m. with throttle wide open and spark plugs removed. Firing order 1L, 3L, 4L, 2L, 2R, 1R, 3R, 4R.

### Carburetor

Stromberg EE-15. Idle adjustment —Two idle adjusting screws 14 control fuel, turn in for lean and out for richer mixtures. If trouble is encountered in getting a good idle, examine idling holes 15, also idle air bleeder tube 5. Intermediate range—Air enters through the entrance at the top and places suction on main discharge jet 3 and idle discharge holes 15. The main metering jets 12 control the flow of fuel during the intermediate throttle position up to approximately 65 m.p.h. From the main metering jet 12 the fuel passes to the main discharge jet 3, where it is mixed with the air from the high speed bleeder 4 and flows into the carburetor barrel and then into the manifold. Wide open range control by main metering jet 12 and main discharge jet 3 and economizer 29. Accelerating pump—On up stroke of piston 25, fuel is drawn into piston chamber through the inlet check valve 28. On the down stroke of the piston, check valve closes and fuel is forced through economizer valve 29.




### Distributor

Auto-Lite IGP-4006. Double breaker type. No manual advance. 20 deg. centrifugal advance. No vacuum advance. Adjust breaker points to .015 in. Spring tension 18 to 20 oz. Advance zero at 300 r.p.m., 2.5 deg. at 600 r.p.m.; 5 deg. at 900 r.p.m.; 7.5 deg. at 1200 r.p.m.; 10 deg. max at 1500 r.p.m.

### Ignition Timing

With breaker points clean and adjusted to .015 in., stationary points open 3 deg. or 1 1/6 flywheel teeth before top center. Top center is shown on the flywheel by "4L" mark.

### Spark Plugs

Standard equipment Champion model J-9-B, 14 mm. Correct plug gap .025 inch.

### Valves

For operating, both intake and exhaust valve tappets should be adjusted to .009 in. Intake and exhaust valve stem diameter .3425 in. Intake and exhaust valve spring pressure 122 lb. at 1 27/32 in. and 59½ lb. at 2 3/16 in. Intake valve seat angle 30 deg., exhaust valve seat angle 45 deg.

### Valve Timing

With intake and exhaust valve tappets adjusted to .016 in., intake valve opens 7½ deg. or 3 flywheel teeth before and exhaust valve closes 5 deg. 2 flywheel teeth after top center.

### Pistons

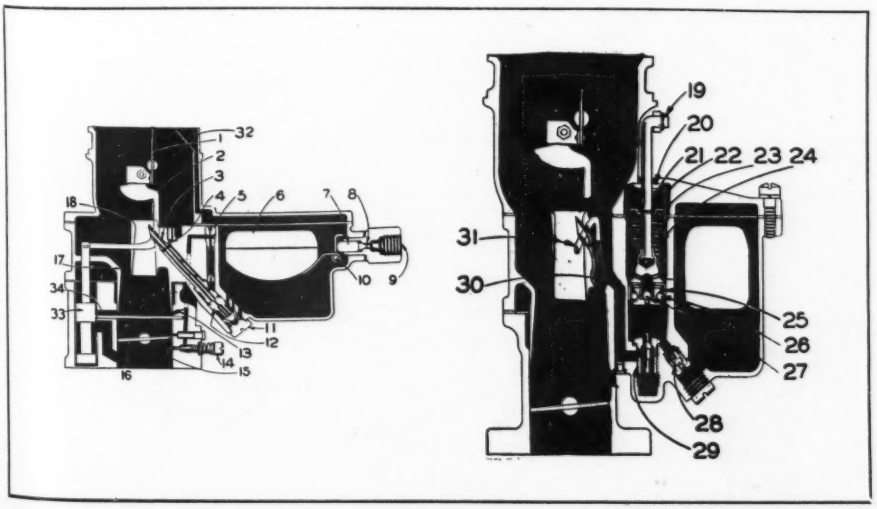
Ray Day aluminum. Clearance at top land .026 in., clearance at skirt .002 in. Wrist pin diameter ⅞ in. Full floating.

### Connecting Rods

Connecting rod and piston assemblies are removed through the top of the block. Rod bearings are 2 in. in diameter and 2⅜ in. long. Bearings are spun in babbitt. Clearance .0022 in. End play .0090 in.

### Main Bearings

Three main bearings 2½ in. in diameter. Bronze backed, babbitt lined interchangeable type.




### Battery

Standard equipment 108 amp. hr., 19 plate USL. Positive terminal grounded.

### Generator

Auto Lite GBR-4603-4. Maximum cold charging rate 23 amp. at 8.75 volts and 2300 r.p.m. Maximum hot charging rate 20 amp. at 8.75 volts and 2500 r.p.m. Fitted with current regulator. Cut out relay closes at 6.8 volts and armature speed of 800 r.p.m. equivalent to a car speed of 9.7 m.p.h.

### Starter

Auto Lite model MAX-4021. Cranking speed 130 r.p.m. Lock torque 25 ft. lb. at 4.0 volts and 880 amp. Running free 65 amp. at 5.5 volts and 5300 r.p.m. Bendix drive.

### Brakes

Bendix hydraulic. Drum diameter 11 in. Length of lining per wheel 24 x 2¼ x 3/16 in. Clearance at heel .010 in. Clearance at toe .010 in.

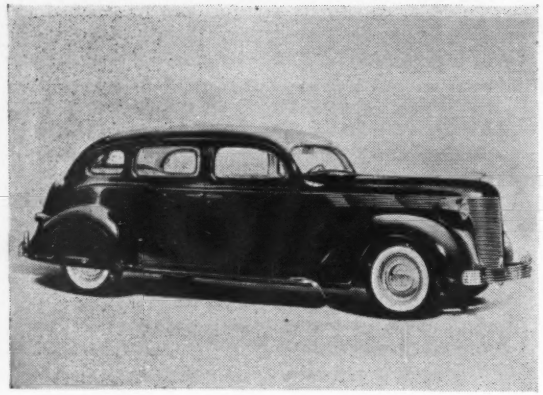
### Wheel Suspension

Caster 1 to 2½ deg. Camber 1 deg. Toe-out zero to ⅛ in. Front wheels should never toe-in. King pin inclination 6 deg.

### Steering

Gemer worm and roller type. To remove worm shaft end play, disconnect drag link from pitman arm. Turn steering wheel about one turn to right from straight-ahead position, loosen lower housing cover screws and remove one shim at a time, tightening cover screws after each shim is removed and check for stiffness. To remove roller shaft end play, turn steering wheel to extreme right or left positionand then back ⅛ turn. Loosen adjustment screw lock nut on engine side of gear and turn in on adjustment until play is removed. To remove backlash between worm and roller it is necessary to remove gear from chassis. Then remove roller shaft from housing and remove one shim at a time. Temporarily reinsert shaft and hold in place while turning steering wheel to center position. Then grip splined end of shaft and try to rotate it. When all backlash is removed with roller in center of worm, reinstall in housing and replace gear in car.

# DeSoto



### Serial Number

Starting 5,517,301.

### Engine

Six cylinder 3⅜ x 4¼ in. The letter A with the engine bore indicates special standard which is .020 in. larger than standard. The letter B indicates .010 in. smaller than standard main and rod bearings. Compression ratio 6.50 to 1. Approximate compression pressure 110 lb.

### Carburetor

Carter model E611. Flange size 1½ in. Main venturi 1 9/32 in. Idle orifice tube jet size .0276 in. Idle passage air bleed size .063 in. Economizer in body .049 in. Float setting—top of float 5/64 in. below top surface of carburetor body casting. Accelerating jets 2—.0354 in., 21/64 in. from end, 2—.0354 in. 1—1/64 in. from end. Main metering jet calibrated to flow 282 to 286 cc. per minute. Step up jet No. 63 drill. Idle adjustment screw ½ to 1¼ turns open. Turn out for richer mixture.

To adjust automatic choke insert a No. 42 drill through the choke valve shaft and in line with the slot in the choke housing. Loosen ball crank clamp screw and lift up on choke rod until the choke valve in carburetor is closed. Then tighten clamp crew and remove drill.

### Distributor

Auto Lite IGS-4010-1. Single breaker type. Adjust points to .020 in. Springs should have 18 to 20 oz. tension.

### Ignition Timing

Breaker points should open .002 in. piston travel or 2 deg. before top center for standard head or at top center for aluminum head. Or use timing marks on crankshaft pulley and pointer on chain cover. To check automatic advance, open throttle suddenly, and with timing directed on crankshaft pulley, timing mark should advance approximately 10 deg. when engine reaches speed of 25 m.p.h. Then as throttle is closed to maintain this speed, timing should advance another 10 deg. If not, replace vacuum advance unit and advance springs in distributor.

### Spark Plugs

Standard equipment for cast iron head, Champion model J-8; for aluminum head use Champion H-10.

### Valve Tappet Clearance

Both intake and exhaust tappets should be adjusted to .010 in. Self-locking tappet adjusting screws are interchangeable with screws having lock nuts.

### Valve Timing

With valve tappets adjusted to .014 in. clearance, exhaust valve should close when piston is .002 in. past top center. When installing new timing chain, punch marks on crankshaft, and camshaft sprockets should line up with the centers of the camshaft and crankshaft.

### Pistons

Fit pistons so that it requires from 5 to 7 lb. pull on a ½ in. wide strip of .002 in. feeler stock placed between the thrust face of the piston and the cylinder wall. Wrist pin diameter 55/64 in.

### Connecting Rods

Rod and piston assemblies are removed through the top of the block. Rod bearings are of the replaceable type. Rods should be installed with the oil hole in the upper half of the bearing toward the valve side of the engine. Bearings should be installed so that the small boss on the bearing lines up with the machined grooves in the rods.

### Battery

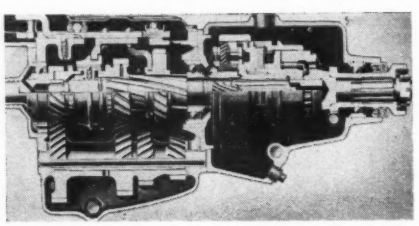
Positive terminal grounded.

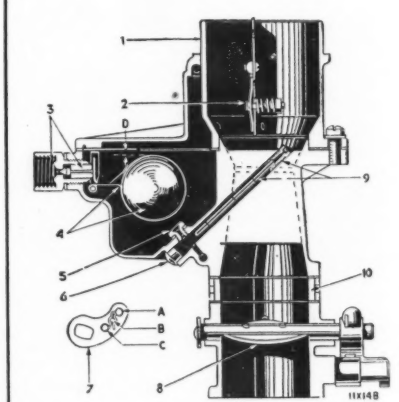
### Generator

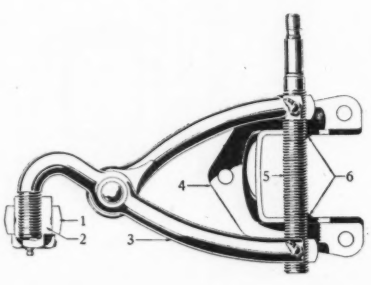
Auto Lite GBW-4803-C. Two brush shunt type. On bench should give 22 amp. and 8 volt at 1600 r.p.m. To test current regulator assembly connect ammeter between the regulator "B" connection and the lead removed from that terminal. Also connect a voltmeter across the "B" and "GD" terminals. Then to test current regulator, run engine at 30 m.p.h. until generator is warm. Ammeter should then have a reading below the maximum noted on the name plate of the regulator and voltage should be between 7.4 and 7.8 volts. Then add an electrical load of a current value in excess of the amp. noted on the regulator at a point between the car ammeter and the battery. If regulator is working correctly, test ammeter will give a reading approximately equal to the maximum current shown on nameplate of regulator.

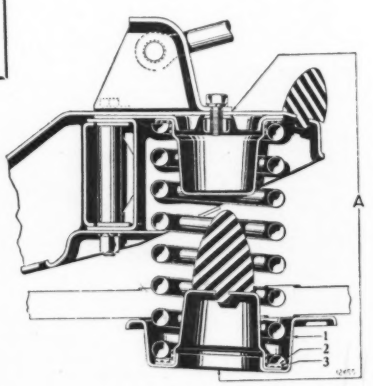
### Steering

When adjusting toe-in, adjust long tie rod to 31 7/32 in. between ball centers and then adjust toe-in with short tie rod. Toe-in should be 0 to ⅛ in. Caster and camber adjustment is made by turning eccentric bushing at the upper end of the vertical support arm. After loosening clamp screw turn bushing to obtain 1½ deg. caster. Camber adjustment is made within ½ revolution from point where correct caster setting is obtained. ¼ deg. positive camber preferred. Distance "A" on front springs should be 9⅞ in. to 10 in.

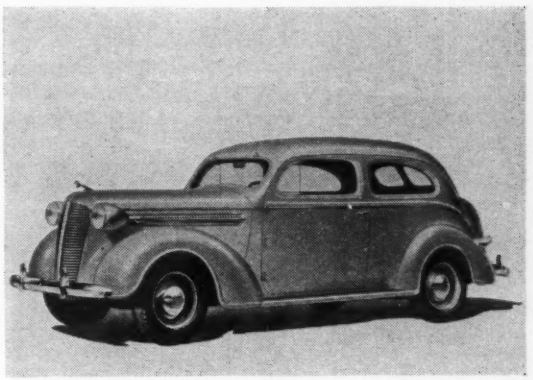




# Dodge

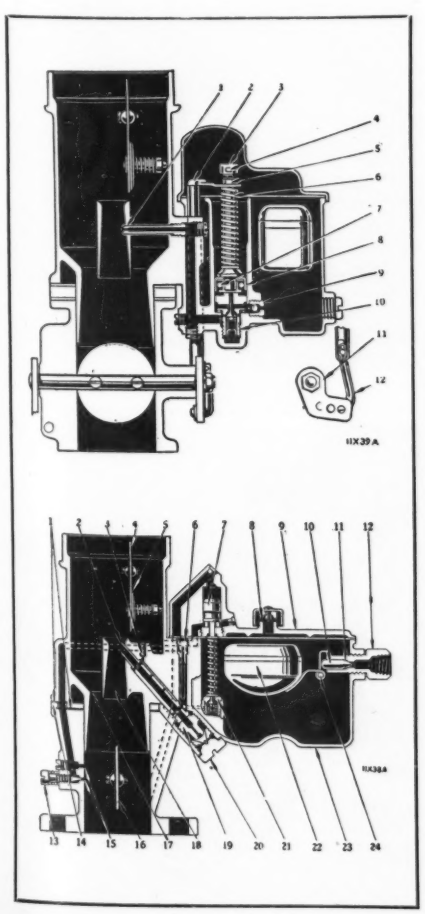


### Engine

Six-cylinder, 3¼ x 4⅜ in. The letter "A" with the engine serial number indicates special standard cylinder bores .020 in. larger than standard. The letter "B" with the engine number indicates a special standard main and rod bearings that are .010 in. smaller than standard. Compression ratio 6.50 to 1. Approximate compression pressure 110 lb. at cranking speed.

### Carburetor

Stromberg Model EXV-2. Idle adjusting screw, 13, controls fuel; turn clockwise for leaner mixture and counter-clockwise for richer mixture. Three positions are provided on accelerating pump lever, 11; use longest stroke for cold-weather operation. For high altitude (3000 ft. and over) and also for warm-weather operation, use short stroke. A new main jet can be installed by removing the main discharge plug, 3, after disconnecting the fuel line. Jet can then be removed by special socket wrench. To check float level, remove accelerating pump lever, float chamber cover and accelerating pump. Measure the distance from the top of the float chamber to the top of the fuel; with engine idling it should be ⅝ in., and can be reset by bending lip on float lever away from needle to raise float and toward needle to lower float level. Automatic choke adjustment—Remove air cleaner and insert a No. 42 drill through the choke valve shaft and in line with the slot in the choke housing. Loosen the bell crank clamp screw and lift up on the choke rod until the choke valve in the carburetor is closed. Tighten clamp screw and remove drill. The accelerator rod is so arranged that when the starter is engaged the carburetor throttle is open slightly. Always check this adjustment when adjusting automatic choke.




### Distributor

Auto Lite IGS-4002-A1. Centrifugal automatic advance 24 deg; vacuum advanced 18 deg. Set breaker point gap to .020 in. Breaker spring tension 18 to 20 oz.

### Ignition Timing

After clearing and adjusting breaker points to .020 in., set ignition to open breaker points when ignition timing marks on crankshaft pulley line up with indicator pointer on timing case cover, or when piston is .007 in. after top center, or when crankshaft is 4 deg. or 1½ flywheel teeth after top center. To check automatic advance, use neon type light directed against ignition timing marks on crankshaft pulley. At idling speed timing mark should line up with pointer. Then if throttle is suddenly opened wide, mark on pulley should advance approximately 10 deg. when engine reaches a speed of 25 m.p.h. If throttle is then closed to maintain this speed, timing mark should advance another 10 deg., approximately.

### Valves

For operating intake tappets should be set to .006 in. and the exhaust to .008 in. with the engine hot.

### Valve Timing

With intake valve tappet set to .011 in. and the exhaust to .012 in., intake valve opens 6 deg. or 2 flywheel teeth, or .015 in. piston travel after top center, and the exhaust valve should close 8 deg. or nearly 3 flywheel teeth, or .027 in. piston travel after top center. When installing a new timing chain, punch marks on crankshaft and camshaft pulleys should be together and in line with the centers of the shafts.

### Pistons

The aluminum alloy pistons, with the pins removed, should be fit so that there is .0015 to .002 in. clearance between the thrust side of the piston and the cylinder wall. It should require from 7 to 14 lb. pull to withdraw a .002-in. feeler from between the cylinder and piston.

### Connecting Rods

Rod and piston assemblies are removed through the top of the block. Rods should be installed with oil hole in upper half of bearing toward the valve side of the engine. Bearings are of the slip-in type and should be installed so the small boss on the bearing lines up with the machined grooves in the rods.

### Battery

Standard equipment 95 amp. hr., 15-plate, Willard. Negative terminal grounded.

### Generator

Auto Lite GBW-4803-A, two-brush shunt type. Maximum charging rate 22 amp. at 8 volts and 1900 r.p.m. with generator warm. To check current regulator, connect ammeter between terminal marked "B" and the lead removed from that terminal. Also connect a voltmeter to terminals marked "B" and "GD." Then with fully charged battery and engine running at 30 m.p.h. and generator warm, the ammeter should show a reading below the maximum noted on the name plate of the regulator and the voltmeter should have a reading of 7.4 to 7.8 volts.

### Starter

Auto Lite MAW 4010.

### Wheel Alignment

Caster 1 to 3 deg., camber ¼ to ¾ deg., toe-in 0 to 1/16 in. King pin inclination 4½ to 5½ deg.

### Steering

To adjust steering arm shaft, loosen set-screw lock nut on engine side of steering housing cover. Then turn set screw until there is a slight drag when turning steering arm shaft. Then back off till free. To set worm, disconnect drag link and also horn wire. Remove cap screws holding grease retainer cover and tube at bottom end of steering gear body. Then remove shims from between body and cover until a pull of ¼ to 1¼ lb. on rim of steering wheel to move it through mid-position. To adjust roller tooth and worm mesh, remove steering gear arm nut and lock washer. Remove steering gear arm, using special puller. Remove cap screws holding steering gear housing cover. Pull out steering arm shaft, toward engine. After removing shims, the cover should be reassembled and the adjustments previously outlined should then be made.

### Brakes

Lockheed hydraulic. To adjust — adjust cams so that there is .012 in. clearance at the top of shoes. Then loosen brake shoe anchor bolt nut on the inside of the brake support and turn eccentric anchor bolt until there is .006 in. clearance at the heel (bottom) of the shoes. Recheck clearance at toe of shoe and tighten anchor bolts and nuts securely. Fill master cylinder to proper level and bleed lines if necessary.

# Ford

**V8 Model 60**

### Engine

V-eight 2.6 x 3.2 in. Firing order 1-5-4-8-6-3-7-4. Compression ratio 6.6 to 1. Approximate compression pressure 112 lb. at cranking speed, wide open throttle and spark plugs removed.

### Carburetor

Stromberg EE-⅞ Economizer setting: Pump piston to rest on seat of by-pass jet (less over travel) with throttle valve cracked open with a 9/32 in. drill, plus or minus 1/32 in. Fuel level: 15/32 in. below top face of float chamber at 3 lb. fuel pressure. Slow idle screw is 1¾ turns from closed throttle position. Metering jet .037 in. Main body ⅞ in. venturi, No. 65 high speed bleeder. By pass jet with one No. 68 hole.

### Distributor

Own design, double breaker type, automatic advance with vacuum control. Breaker arm spring tension 20 to 24 oz. Breaker point gap .014 to .016 in. Automatic advance starts at 400 r.p.m. of engine. Maximum total advance of 20 deg. at 3,000 r.p.m. of engine.

### Ignition Timing

Clean and adjust breaker points to .014 to .016 in. Distributor can only be installed in the correct position. Recommended setting is 4 deg. before top dead center. A slotted screw on right side of distributor permits small range of advance and retard. Move upward to advance. Final road setting—back off the vacuum brake adjusting screw until the engine pings under load, then turn adjusting screw in just enough to remove the ping and tighten adjusting screw lock. Firing order 1-5-4-8-6-3-7-2.

### Spark Plugs

Standard Equipment Champion H10, 14 mm. Correct gap .025 in.

### Valves

Valve tappet clearance .0125 to .0135 in. Valve head diameter 1.281 in. Valve seat angle 45 deg. Valve stem diameter .2785 to .2795 in. Exhaust valve seat high tungsten, chrome alloy steel inserts. Valve spring pressure, valve closed 26 to 30 lb., valve open 48 to 52 lb. Valve spring length with valve closed 2.05 in. Valve lift .251 in.

### Valve Timing

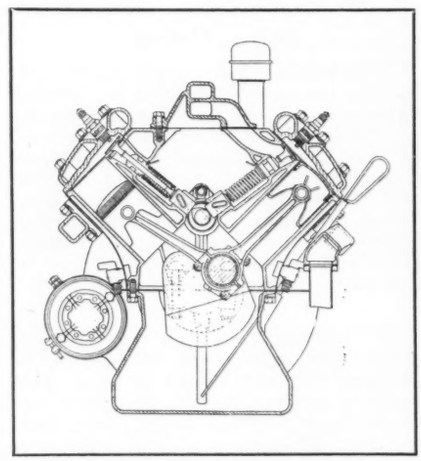
Intake valve opens 9½ deg. or nearly 3¼ flywheel teeth before top center and the exhaust valve closes 6½ deg. or nearly 2¼ flywheel teeth after top center. When installing new timing gears, mesh the marked tooth on the camshaft gear with the marked tooth on the crankshaft gear.

### Pistons

Light weight cast alloy steel. Weight without pins and rings 228 to 232 grams. Weight with pins and rings 302.65 grams. Rod and piston assemblies are removed through the top of the block. It should require an 8 to 12 lb. pull to remove a .0025 in. feeler placed between thrust face of piston and cylinder wall.

### Rings

One .1545 in. wide oil ring, two .0920 in. wide compression rings. Both oil and compression rings should have a gap of .005 to .012 in.



### Connecting Rods

Rod bearings are full floating and interchangeable with internal and external bearing surfaces. Crankpin diameter 1.80, length .70 in. Rod and piston assemblies are removed through top of the block.

### Main Bearings

Replaceable steel backed babbitt type with piloted bearing caps. Diameter 1.6 in. Lengths: Front, 1.66 in.; center, 1.64 in.; rear, 2.00 in.

Oil pump body is integral with front main bearing cap.

### Battery

Own make, 100 amp. hr. at 20 hr. rate, 17 plate. Positive terminal grounded.

### Generator

Third brush regulated type. Move third brush in direction of armature rotation to increase charging rate. Voltage at cut-out closing 7 volts. Amp. to open 3 amp. Maximum charging rate 15 amp. hot, at 6.5 volts and 1650 r.p.m.

### Starter

Normal engine cranking speed 100 r.p.m. Stall torque 14 ft. lb. at 500 amp. Bendix drive. Number of flywheel teeth 122.

### Brakes

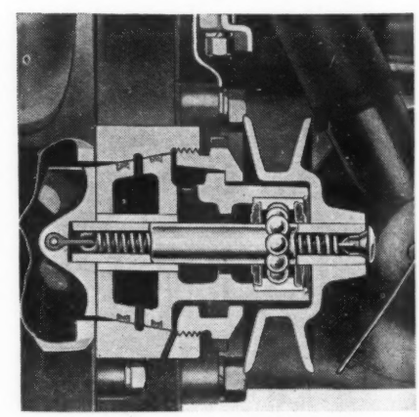
Brake shoes should be adjusted to .005 in. clearance at heel. Backing plate and shoe assemblies are available on exchange basis. Brake drum diameter 12 in.

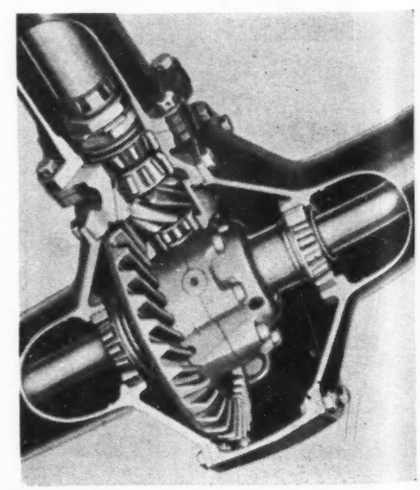
### Wheel Alignment

Caster 4½ to 9 deg. Camber ¼ to 1 deg. Toe-in 1/16 in. should be in proportion to camber. Toe-out 15 deg. turn 16 2/3 deg. 20 deg. turn 23 1/3 deg. Camber plus side inclination 8¼ to 9¼ deg.

### Cooling System

In case of any water pump impeller failure it is important that a thorough check be made for any obstructions in block which might come in contact with the impeller. Also remove any broken portions of original impeller. Water in the radiator must be maintained at a level not less than 2 in. from top of filler neck. Radiator capacity 3.8 gal. Radiator hose 1½ in. diameter.





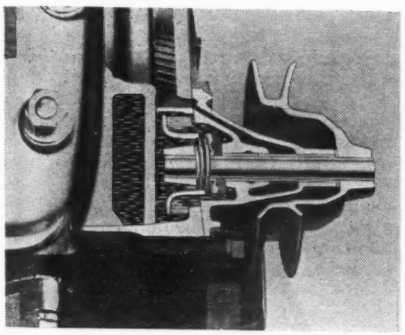
# Ford

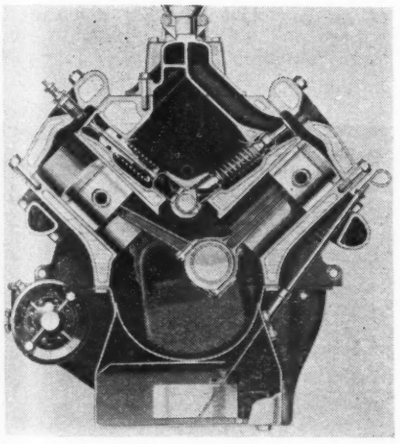
## Engine

V-eight, 3 1/16 x 3¾ in. Compression ratio 6.12 to 1. Compression pressure 100 lb. at cranking speed. Firing order 1-5-4-8-6-3-7-2.

## Carburetor

Stromberg EE-1. Economizer setting—pump piston to rest on seat of by-pass jet (less over travel) with throttle valve cracked open with a 19/64-in. drill, plus or minus 1/64 in. Fuel level 15/32 in. below top face of float chamber with fuel pressure of 3 lb. Slow idle screw 2¼ turns from closed throttle position. Main body with 31/32-in. venturi. No. 65 high-speed bleeder, No. 40 idle air bleeder and No. 60 pump nozzle. Metering jet .045 in. By-pass jet one No. 65. For operation at 5000 to 10,000 ft. elevation, use .043-in. metering jet. For 10,000 to 15,000 ft. elevation use .041-in. metering jet. For 15,000 ft. and over elevation, use .039-in. metering jet.





## Distributor

Own make with double breaker arm. Centrifugal governor advance with vacuum control. Automatic advance starts to operate at 400 r.p.m. of engine. Maximum total advance 20 deg. (crankshaft) at 3000 r.p.m. of engine. Breaker point gap .014 to .016 in. Breaker arm spring tension 20 to 24 oz. Resistance of primary circuit 1 to 1 1/3 ohms.

## Ignition Timing

With breaker points clean and set to .014 in. gap, points should open 4 deg. or 1¼ flywheel teeth after top center. Distributor can only be installed in the correct position. A slotted screw on right side of distributor permits small advance and retard. Move upward to advance. Final road setting—back off vacuum brake advance screw until the engine pings under load, then turn adjusting screw in just enough to remove ping and tighten adjusting screw lock. Firing order 1R-1L-4R-4L-2L-3R-3L-2R.

## Spark Plugs

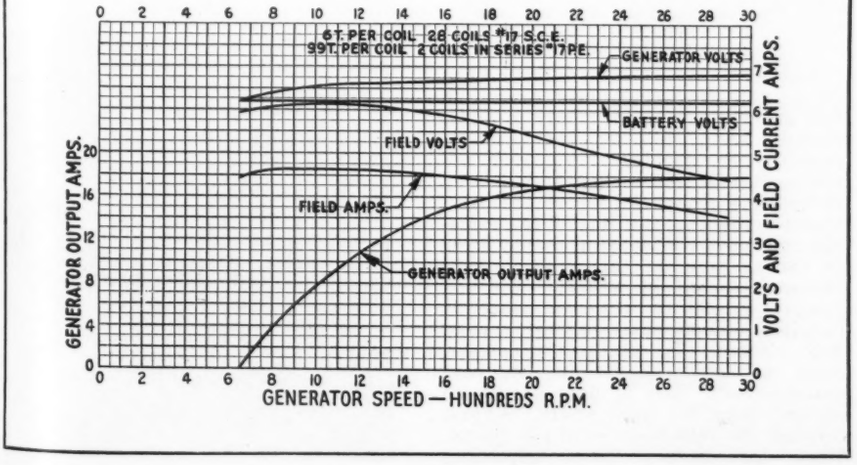
Standard equipment, Champion No. 7, 18 mm. Correct gap .025 in.

## Valve Timing

Intake valve opens 9½ deg or 3 flywheel teeth before top center, and exhaust valve closes 6½ deg. or 2 flywheel teeth after top center. When installing new timing gears, marks on camshaft gear must mesh with marks on crankshaft gear.

## Valves

Operating valve tappet clearance .0125 to .0135 in. Valve head diameter 1.537 in. Valve seat angle 45 deg. Valve stem diameter .3105 to .3115 in. Exhaust valve seats high tungsten, chrome alloy steel inserts. Valve spring length with valve closed 2.13 in. Valve spring pressure, valve closed, 35 to 38 lb.; valve open, 65 to 72 lb. Valve lift .292 in.


6T. PER COIL 28 COILS #17 S.C.E.
99T. PER COIL 2 COILS IN SERIES #17 P.E.
GENERATOR VOLTS
BATTERY VOLTS
FIELD VOLTS
FIELD AMPS.
GENERATOR OUTPUT AMPS.
GENERATOR OUTPUT AMPS.
VOLTS AND FIELD CURRENT AMPS.
GENERATOR SPEED — HUNDREDS R.P.M.
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

**V8 Model 85**

## Pistons

Light weight cast alloy steel. Weight without pin and rings 301 to 305 grams. Weight with pin and rings, 408.8 to 416.8 grams. Piston and rod assemblies are removed through the top of the engine. A pull of 8 to 12 lb. should be required to withdraw .003-in. feeler from between the thrust face of the piston and the cylinder wall.

## Connecting Rods

Rod bearings are of the interchangeable full-floating type with internal and external bearings surfaces. Crankpin diameter 2.2195 to 2.220 in., length .8695 in. to .8725 in.

## Main Bearings

Steel backed babbitt replaceable type with piloted bearing caps. Diameter 2.4 in. Length front bearing 1.83 in., center 1.73 length, rear 2.25 in. End play .002 to .006 in.

## Battery

Own make, 100 amp. hour (at 20 hour rate) 17 plate. Positive terminal grounded.

## Generator

Charging rate controlled by third brush. Move third brush in direction of armature rotation to increase rate. Maximum charging rate 15 amp. Voltage at cut-out closing 7 volts. Car speed at closing 10 m.p.h. Current to open 3 amp.

## Starter

Normal engine cranking speed 100 r.p.m. Maximum torque 14 ft. lb. at 500 amp. Bendix drive.

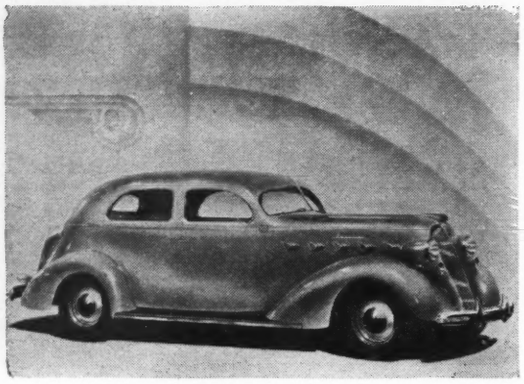
## Brakes

Clearance between lining and drum at anchor .005 in. Brake drum diameter 12 in.

## Wheel Alignment

Caster 4½ to 9 deg. Camber ¼ to 1 deg. Camber plus side inclination 8¼ to 9¼ deg. Toe-in 1/16 in. Toe-in must be in proportion to camber. Toe-out—15 deg. turn 16 2/3 deg. 20 deg. turn 23 1/3 deg.

# Graham



**Series 95**

### Engine

Six cylinder, 3¼ x 4 in. Compression ratio 6.7 to 1. Compression pressure 120 lb. at 50 r.p.m., with spark plugs removed and throttle wide open. Firing order 1-5-3-6-2-4.

### Carburetor

Marvel model B-2 single downdraft. Idle adjustment controls fuel, turn out rich and in for lean.

### Distributor

Delco Remy model 623-A. Single breaker arm type. Centrifugal and vacuum advance. 10 deg. vacuum advance. Breaker point gap .018 in.

### Ignition Timing

With breaker points clean and adjusted to .018 in. breaker points should open at top center. Set distributor so that points open when IGN or TC mark lines up with pointer at inspection hole in right side of flywheel housing.

### Spark Plugs

Standard equipment Champion model J-9, 14 mm. Correct gap .025 in.

### Valves

Operating valve tappet clearance is .010 in. Valve head diameter intake 1 33/64 in., exhaust 1 21/64 in. Valve stem diameter 5/16 in. Valve spring pressure, valve open 87 lb., valve closed 34 lb.

### Valve Timing

With intake and exhaust valve tappets set to .012 in., intake valve opens 2 deg. or approximately 1 flywheel tooth after top center and the exhaust valve closes 11 deg. or 4 flywheel teeth after top center.

### Pistons

Bohn, autothermic strut type. Weight without rings or pin 17 oz. clearance at skirt .0025 in. Wrist pin diameter 13/16 in. Pin locked in rod.

### Connecting Rods

Connecting rod and piston assemblies are removed through the top of the block. Rod bearings are of the interchangeable type and are 2 1/16 in. in diameter and 1⅛ in. long. Rod bearing clearance .002 in.

### Main Bearings

Cadmium silver steel backed bearings. Diameter 2¼ in. Length front 1 5/32 in., length second and third 1 5/16 in. Length rear 1 35/64 in.

### Battery

Standard equipment, 90 amp. hr., 13 plate Willard. Positive terminal grounded.

### Generator

Delco Remy model 948-B. Maximum charging rate hot 16.5 amp., at 8.1 volts and 2900 r.p.m. Maximum charging rate cold 19.5 amp. at 8.3 volts and 2400 r.p.m. Charging controlled by current relay.

### Starter

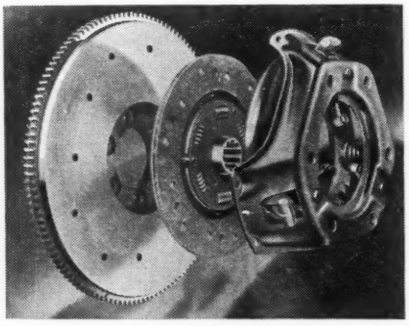
Delco Remy model 738-T. Lock torque 12 ft. lb. at 3.6 volts and 475 amp. Running free 5000 r.p.m. and 65 amp. at 5 volts. Drive engagement by manual gear.

### Wheel Alignment

Caster 4 to 4½ deg. Camber 1 deg. Toe-in ⅛ to 3/16 in. King pin inclination 7½ deg.

### Brakes

Hydraulic operating in 9 in. drums.



Length of lining per wheel 18 x 1¾ x 3/16 in.

### Steering

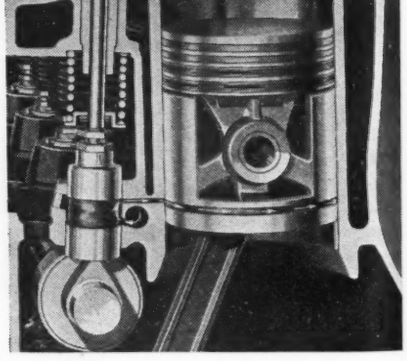
Ross cam and lever, twin lever type. To adjust—first disconnect drag link and loosen instrument board bracket clamp. Then take up end play of cam—loosen housing side cover adjusting screw and adjust to a barely perceptible drag. Unscrew the four clamp screws at the top of the housing and move the housing upper cover as far as possible (about ¼ in.) to permit removal of shims. Clip and remove a .003 in. shim or more as required. Reassemble clamp screws and tighten. To adjust for proper mesh of lever shaft pins in cam groove—back lash of pins shows up as end play in lever shaft. Adjust through the mid-position of pin travel. Then, tighten side cover adjusting screw until a slight drag is felt through the mid-position high range when turning the steering wheel from one extreme to the other. When proper adjustment is made, tighten lock nut. Column alignment—tighten instrument board bracket clamp on column. Turn steering wheel to see if stiffness, if any, exists. If so, the gear has been adjusted too tight or steering column is out of alignment.

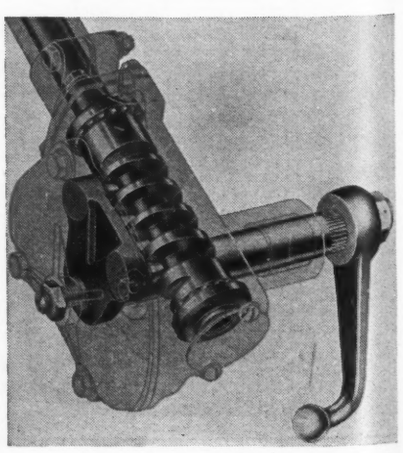
### Brakes

Lockheed hydraulic with mechanically operated hand brake on rear wheels for parking. To adjust—jack up all four wheels, turn adjusting screw on front shoe toward the front until a slight drag is felt, then back off until wheel is free. Turn adjusting screw on rear shoe toward the rear, until drag is felt, then back off until wheel is free. Repeat on other three wheels. To adjust hand brake—check forward brake lever on each brake first. With cables slack, turn adjusting screw on cable until there is a barely perceptible amount of clearance between end of lever and brake shoe. Then, tighten lock nut on cable lever. Pull hand brake lever up into first notch on sector and adjust turnbuckle on cable to remove all slack and place enough tension on cable to cause cable lever adjusting screw to pull away slightly from stop.

### Rear Axle

Eleven teeth on pinion, 49 teeth on ring gear. Pinion adjusted by means of shims. Use 160 EP lubricant in winter and 90 EP lubricant in summer. Capacity 2½ pints of lubricant.





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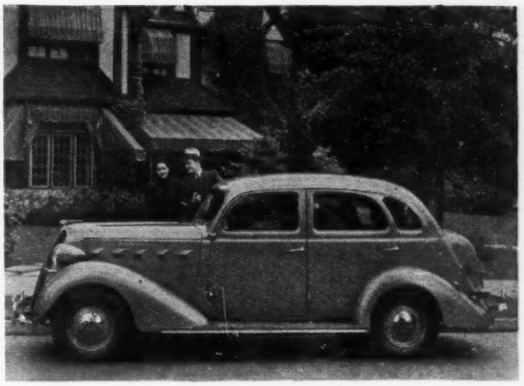


**Series 116**

### Engine

Six cylinder 3¼ x 4 in. Compression ratio 6.7 to 1. Compression pressure 120 lb. at 50 r.p.m. with throttle wide open and spark plugs removed. Firing order 1-5-3-6-2-4.

### Carburetor

Marvel model B-2 Single downdraft. Idle adjustment controls fuel. Turn out for rich and in for lean.

### Distributor

Delco Remy model 623-S. Single braker arm type. Centrifugal and vacuum advance. 10 deg. vacuum advance. Breaker point gap .018 in. Firing order 1-5-3-6-2-4.

### Ignition Timing

With breaker points clean and adjusted to .018 in. breaker points should open 4 deg. or 1½ flywheel teeth after top center. Or set breaker points to open when IGN mark lines up with pointer.

### Spark Plugs

Standard equipment, Champion model J-9, 14 mm. Correct gap .025 in.

### Valves

Operating valve tappet clearance is .010 in. Valve head diameter intake 1 33/64 in., exhaust 1 21/64 in. Valve stem diameter 5/16 in. Valve spring pressure, valve open 87 lb., valve closed 34 lb.

### Valve Timing

With intake and exhaust valve tappets set to .012 in., intake valve opens 4½ deg. or approximately 1½ flywheel teeth before top center and the exhaust valve closes 4½ deg. or approximately 1½ flywheel teeth after top center.

### Pistons

Bohn, autothermic strut type. Weight without pins or rings 17 oz. Clearance at skirt .0025 in. Wrist pin diameter 13/16 in. Pin locked in rod.

### Connecting Rods

Connecting rod and piston assemblies are removed through the top of the cylinder block. Rod bearings are of the interchangeable type and are 2 1/16 in. in diameter and 1⅛ in. long. Rod bearing clearance is .002 in.

### Main Bearings

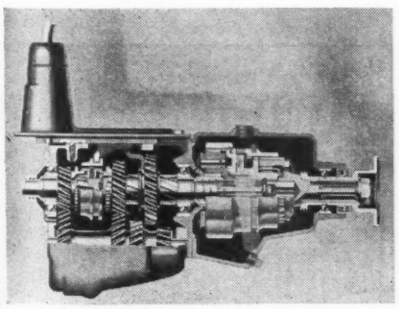
Cadmium silver, steel backed, interchangeable type. Diameter 2¼ in. Length front 1 5/32 in., length second and third 1 5/16 in. Length rear 1 35/64 in.

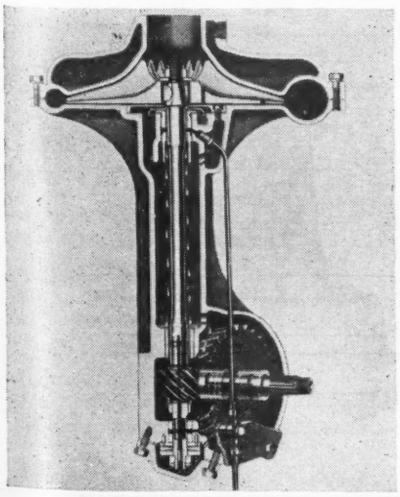
### Battery

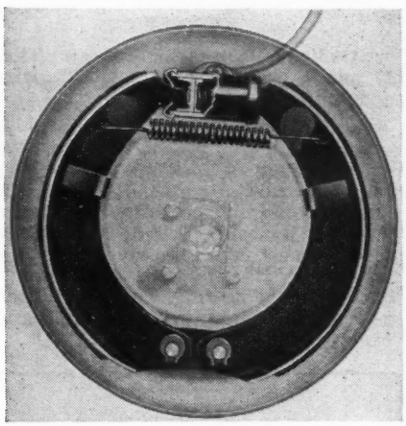
Standard equipment 105 amp. hr., 15 plate Willard. Positive terminal grounded.

### Generator

Delco Remy model 948-Z. Maximum charging rate hot, 22 amp. at 8.0 volts and 3000 r.p.m. Maximum charging rate cold, 25 amp. at 8 volts and 3500 r.p.m.







### Starter

Delco Remy model 738-T. Lock torque 12 ft. lb. at 3.6 volts and 475 amp. Running free 5000 r.p.m. and 65 amp. at 5 volts. Manual gear drive engagement.

### Wheel Alignment

Caster 3 to 4 deg. Camber 1 deg. Toe-in ⅛ to 3/16 in. King pin inclination 7½ deg.

### Steering

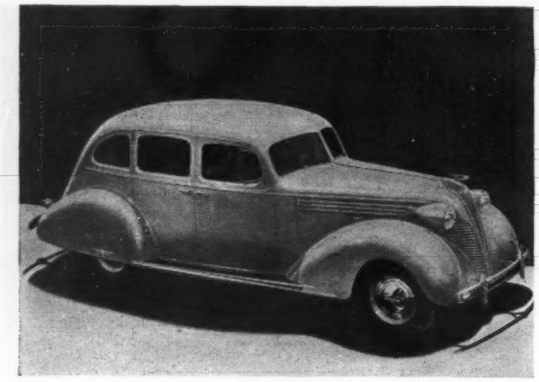
Ross cam and lever, twin lever type. To adjust—first disconnect drag link and loosen instrument board bracket clamp. Then to take up end play of cam — loosen housing side cover adjusting screw and adjust to a barely perceptible drag. Unscrew the four clamp screws at the top of the housing and move the housing upper cover as far as possible (about ¼ in.) to permit removal of shims. Clip and remove a .003 in. shim or more as required. Reassemble clamp screws and tighten. To adjust for proper mesh of lever shaft pins in cam groove—back lash of pins shows up as end play in lever shaft. Adjust through the mid-position of pin travel. Then tighten side cover adjusting screw until a slight drag is felt through the mid-position high range, when turning the steering wheel from one extreme to the other. When proper adjustment is made, tighten lock nut. Column alignment —tighten instrument board bracket clamp on column. Turn steering wheel to see if stiffness, if any, exists. If so the gear has been adjusted too tight or steering column is out of alignment.

### Brakes

Brakes hydraulic operating in 11 in. drums. Length of lining per wheel 23 in. x 1¾ in. x ¼ in.

Lockheed hydraulic with mechanically operated hand brake on rear wheels for parking. To adjust—jack up all four wheels, turn adjusting screw on front shoe toward the front until a slight drag is felt, then back off until wheel is free. Turn adjusting screw on rear shoe toward the rear, until drag is felt, then back off until wheel is free. Repeat on other three wheels. To adjust hand brake—check forward brake lever on each brake first. With cables slack, turn adjusting screw on cable until there is a barely perceptible amount of clearance between end of lever and brake shoe. Then tighten lock nut on cable lever. Pull hand brake lever up into first notch on sector and adjust turnbuckle on cable to remove all slack and place enough tension on cable to cause cable lever adjusting screw to pull away slightly from stop.

# Hudson



**Six Cylinder**

### Engine

Starting engine No. 90,000. Six cylinder 3 x 5 in. Firing order 1-5-3-6-2-4, Compression ratio Std. 6.25 to 1, Super power dome 7.00 to 1. Approximate compression pressures 105 and 120.

### Carburetor

Carter 1 in. dual, 4 bolt flange. Pump adjustment—With pump connector link in short stroke (lower hole) adjust throttle connector rod by bending to give 15/64 in. pump stroke. Full pump stroke is obtained by moving throttle from closed to wide open position. Travel can be checked by marking shaft at casting at wide open position and then at fully closed position and gaging distance between marks. Then replace springs and retainers. Metering rod adjustment requires special tool Carter part No. T109-27. Anti-percolator adjustment—Back out throttle lever adjusting screw. Anti-percolator should be checked after metering rods setting and installation of metering rods in carburetor. With throttle valves tightly closed, insert a .015 in. feeler gage between percolator stem and lip on percolator arm, adjust lips on anti-percolator arm to depress stem so indicator line is flush with top of anti-percolator plug. Be sure even adjustment is made on both anti-percolator units. Install air horn assembly, dash pot arm, pin and screw assembly and then dash pot connector link and pin spring. Unloader adjustment—With throttle wide open, distance between upper edge of choke valve and wall of air horn should be ¼ in. Adjustment can be made by bending lip on fast idle connector link. Fast idle adjustment—Hold choker valve closed and adjust fast idle arm screw to give .018 in. opening between edge of throttle valve and bore of carburetor side opposite port. Use gage No. 15596.

### Distributor

Auto Lite model IGW-4013-A. Single breaker type, automatic advance. Breaker arm gap .020 in. Spring tension 16 to 20 oz. Minimum advance 3, 7, 10, 13, 16, 19, 22, 25, 27, 27, at 400, 560, 720, 880, 1040, 1200, 1360, 1520, 1630, and 2000 r.p.m. respectively.

### Ignition Timing

Clean and adjust breaker points to .020 in. gap. Set ignition so that breaker points open when DC mark on flywheel lines up with pointer.

### Spark Plugs

Standard equipment Champion J-8, set gap to .022 in.

### Valves

Operating valve tappet clearance should be adjusted with the engine warm, intake .006 in., exhaust .008 in.

### Valve Timing

Intake valve opens 10 2/3 deg. or 4 flywheel teeth before top center and exhaust valve closes 18 2/3 deg. or 6¾ flywheel teeth after top center. When installing new timing gears, mesh the punch marked tooth of the crankshaft gear between the two punch marks on the camshaft gear.

### Connecting Rods

Rod and piston assemblies are withdrawn through the top of the block. Bearings are adjustable by removing shims.

### Main Bearings

Puller required to remove front and rear bearings as sufficient force must be applied to shear the packing in the groove. After replacing bearing cap and cleaning the grooves, drive cotton wicking into the front bearing cap horizontal hole first, then drive into the vertical holes of both front and rear bearing caps.

### Battery

Standard equipment, 105 amp. hr., 17 plate National battery. Positive terminal grounded.

### Generator

Auto Lite GCJ-4803-A. To check voltage regulator connect ammeter between the regulator "B" terminal and the lead removed from this terminal. Also connect a voltmeter across the regulator "B" and "GD" terminals. Battery must be fully charged. Then with engine running at 30 m.p.h. and the generator warm, ammeter should read below the maximum to which it was set and the voltmeter should read between 7.4 and 7.9 volts.

### Starter

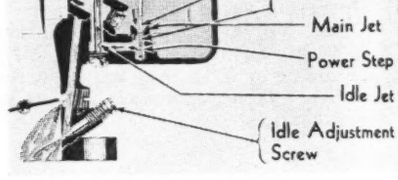
Auto Lite model MAB 4075. On no load test should draw 60 amp. at 5.5 volts at 2250 r.p.m. Lock torque test —780 amp. at 4.0 volts, 22.5 ft. lb.

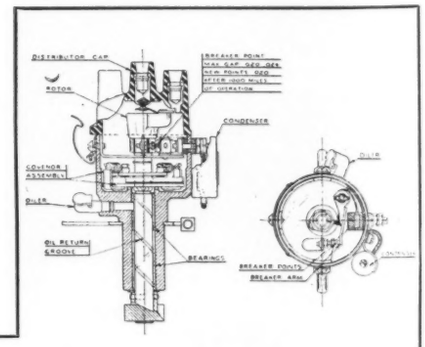
### Clutch

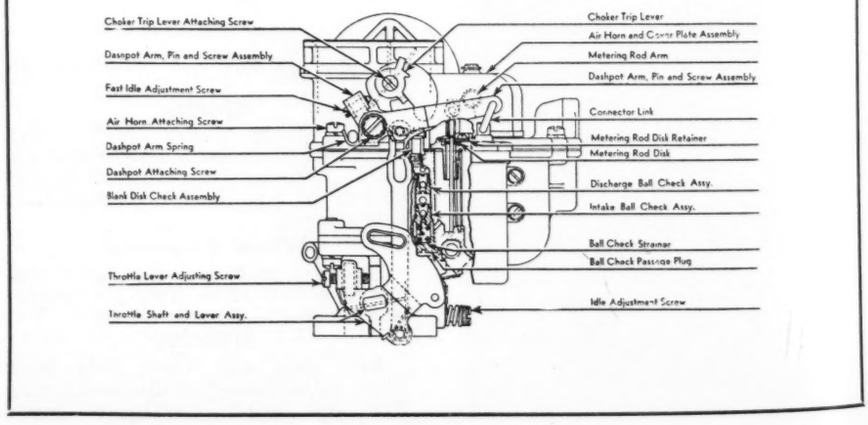
To drain clutch, crank engine until one of the plugs in the front of the flywheel is in the timing inspection opening at the left side of the engine rear support plate. Remove plug and crank engine until star on flywheel is in line with timing pointer. After draining, again crank engine until plug hole lines up with inspection opening and refill clutch with proper lubricant.

### Steering

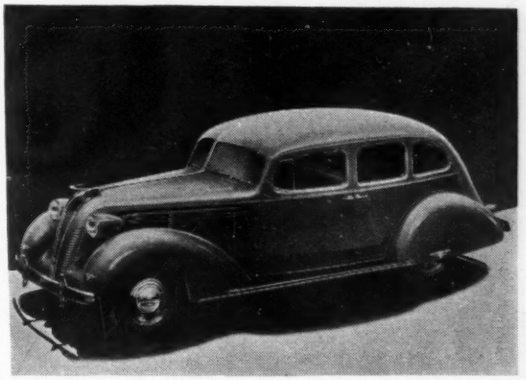
Caster 1 to 2 deg. Camber 1½ deg., toe-in ⅛ in. King pin inclination 7 deg.




Choker Trip Lever Attaching Screw
Dashpot Arm, Pin and Screw Assembly
Fast Idle Adjustment Screw
Air Horn Attaching Screw
Dashpot Arm Spring
Dashpot Attaching Screw
Blank Disk Check Assembly
Throttle Lever Adjusting Screw
Throttle Shaft and Lever Assy.
Choker Trip Lever
Air Horn and Cover Plate Assembly
Metering Rod Arm
Dashpot Arm, Pin and Screw Assembly
Connector Link
Metering Rod Disk Retainer
Metering Rod Disk
Discharge Ball Check Assy.
Intake Ball Check Assy.
Ball Check Strainer
Ball Check Passage Plug
Idle Adjustment Screw

# Hudson



## Eight Cylinder

### Engine

Starting engine No. 18,000. Eight-cylinder, 3 x 4½ in. Firing order 1-6-2-5-8-3-7-4. Compression ratio 6.25 to 1 standard. Approximate compression pressures 105 lb.

### Carburetor

Carter carburetor Model 344 S. Pump adjustment: With pump adjustment link in short stroke (lower hole), adjust throttle connector rod by bending it to give 15/64-in. pump stroke. Travel can be checked by marking shaft at casting at wide-open position and fully closed position and gaging distance between marks. After adjusting pump stroke, replace connector rod springs and replace spring retainers. Metering rod adjustment should be made when reassembling carburetor or when new metering rods are installed. Carter gage No. T109-27 should be used. Anti-percolator adjustment should be checked after metering rod setting. Back out throttle lever adjusting screw and do not disturb metering rod setting. With throttle valves tightly closed, insert .015-in. feeler gage between anti-percolator stem and lip on anti-percolator arm, and adjust lips on anti-percolator arm to depress anti-percolator stem so indicator line is flush with top on anti-percolator plug. Be sure even adjustment is made on both lips. Install air horn assembly, dash pot arm, pin and screw assembly. Then install dash pot connector link and pin spring. Adjustment for unloader: With throttle wide open, distance between upper edge of choke valve and wall of air horn should be ¼ in. Adjustment can be made by bending lip on fast idle connector link. If unloader is adjusted properly, with throttle wide open, move choker valve wide open and choker valve will be locked in wide-open position. Closing throttle will release choker valve. Fast idle adjustment: Hold choker valve tightly closed and adjust fast idle arm screw to give .018 in. opening between edge of throttle valve and bore of carburetor side opposite port. Use Carter gage No. 15596.

### Distributor

Auto Lite Model IGP-4008-A, single breaker type, full automatic advance. Breaker arm gap .017 in. Spring tension 18 to 20 oz. Minimum advance 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 33, 33 at 400, 535, 670, 800, 935, 1070, 1210, 1345, 1480, 1615, 1700, and 2000 r.p.m. respectively.

### Ignition Timing

Clean and adjust breaker points to .017 in. gap. Set ignition so that points open when "DC" mark on flywheel lines up with pointer. Timing inspection hole on left side of engine rear support plate.

### Spark Plugs

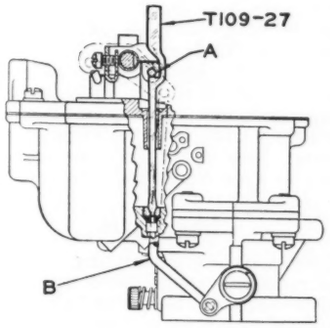
Standard equipment Champion J-8, set gap to .022 in.

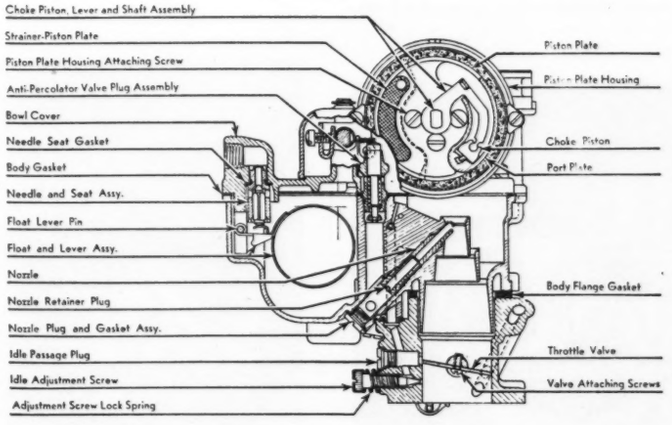
### Valves

Operating tappet clearance should be adjusted with the engine warm, intake .006 in., exhaust .008 in.

### Valve Timing

Intake valve opens 10 2/3 deg. or 4 flywheel teeth before top center and exhaust valve closes 18 2/3 deg. or 6¾ flywheel teeth after top center. When installing new timing gears, mesh punch-marked tooth of the crankshaft gear between the two punch marks on the camshaft gear.




### Connecting Rods

Rod and piston assemblies are withdrawn through the top of the block. Bearings are adjustable by removing shims.

### Main Bearings

Puller required to remove front and rear bearings, as sufficient force must be applied to shear the packing in the groove. After replacing the bearing cap and cleaning the grooves, drive cotton wicking into the front bearing cap horizontal hole first, then drive into the vertical holes of both front and rear bearing caps.

### Generator

Auto Lite GCJ-4803-A. Maximum charging rate, hot, 21.7 amp. at 8 volts and 2700 r.p.m. To check voltage regulator, connect ammeter between regulator "B" terminal and the lead removed from that terminal. Also connect voltmeter across regulator "B" terminal and "GD" terminal. Battery must be fully charged. Then with the engine running at 30 m.p.h. and the generator warm, ammeter should read below the maximum to which it was set and the voltmeter should read between 7.4 and 7.9 volts.

### Starter

Auto Lite Model MAB 4075. On no-load test should draw 60 amp. at 5.5 volts at 2250 r.p.m. Lock torque test —780 amp. at 4.0 volts, 22.5 ft. lb.

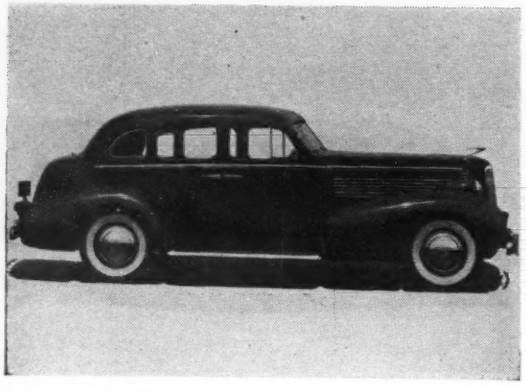
### Clutch

To drain clutch, crank engine until one of the plugs in the front of the flywheel is in the inspection opening at the left side of the engine rear support plate. Remove plug and crank engine until star on the flywheel is in line with the timing pointer. After draining, again crank the engine until plug hole lines up with inspection opening and refill clutch with proper lubricant.

### Steering

Caster 1 to 2 deg. Camber 1½ deg. Toe-in 0 to ⅛ in. King pin inclination 7 deg.

# LaSalle



### Engine

V-8, 3⅜ in. x 4½ in. Standard compression ratio 6.25 to 1, optional compression ratio 5.75 to 1. Approximate compression pressures 105 lb. and 95 lb. at cranking speed, with throttle wide open and spark plugs removed. Firing order 1-8-7-3-6-5-4-2.

### Carburetor

Stromberg AA-25. Fuel level ⅝ in. below top surface of the float chamber at 3 lb. fuel pressure, which corresponds to the bottom of the float level sight plug hole. When resetting floats and service tool SER-292 is not available, the distance between the top of the float and the gasket should be 1 13/32 in. Float level can be checked only when engine is running.

Idle needle valves control fuel, turn in for lean and out for rich. When making idle adjustment, have engine warm and have idle speed adjustment set to a speed of 7 m.p.h. Taking one barrel at a time, turn idle adjustment in until engine falters, then turn out until engine begins to roll. Then turn adjustment in until engine runs smoothly. Then adjust the other idle valve in a similar manner. Automatic choke is built completely into the carburetor. To adjust thermostat, remove the case and allow the thermostat to reach a temperature of 70 deg. F. When the thermostat reaches 70 deg., the inside hook of the thermostat should coincide with the zero marking on the case. If it is impossible to get the thermostat to 70 deg. you can provide for the difference by allowing one graduation on case for every 5 deg. variation in temperature of the thermostat. Then reassemble case onto the air horn so that the hook comes into contact with pin on the lever without any tension and with the choke valve in the wide open position. The zero mark on the case will then line up with the notch on the air horn. Then revolve thermostat case 15 notches rich as indicated by the arrow and fasten the screws securely.

### Distributor

Delco Remy model 665-G, with 20 deg. manual advance, 22 deg. centrifugal advance. No vacuum advance. Breaker point gap .015 in. Firing order 1-8-7-3-6-5-4-2.

### Ignition Timing

With points clean and set to .015 in., points should open 5 deg. or 2¼ flywheel teeth before top center.

### Spark Plugs

Standard equipment AC type K-7, 14 mm. Correct gap .026 in.

### Valves

Valve tappets provided with automatic adjustment. Intake valve head diameter 1.88 in. Exhaust valve head diameter 1.63 in. Intake and exhaust valve seat angle 45 deg. Intake and exhaust valve stem diameter .341 in. Intake and exhaust valve spring length, valve open 1.58 in., pressure 145 lb. Intake and exhaust valve spring length, valve closed, 1.92 in., pressure 66 lb.

### Valve Timing

Intake valve opens at top center, and exhaust valve closes 10 deg. or approximately 4½ flywheel teeth after top center.

### Pistons

Lo-Ex aluminum, T-slot annodized. Weight without pin or rings 16.88 oz. Clearance at top land .019 in. Clearance at skirt .0013 in. Wrist pin diameter ⅞ in. Wrist pin full floating. Rod and piston assemblies removed through the top of the block.

### Connecting Rods

Bearings are of the steel backed babbitt, interchangeable type, 2.46 in. in diameter and 2 1/32 in. long. Clearance .0015 in., end play .0045 in.

### Main Bearings

Three main bearings of the slip in type. 2½ in. in diameter. Lengths—front 1 1/16 in., center 1 5/32 in., 1 31/32 in.

### Battery

Sandard equipment, Delco 110 amp. hr. Positive terminal grounded.

### Generator

Delco Remy model 918-C. Maximum charging rate cold, 29 amp. at 8.0 volts and 4000 r.p.m. Maximum charging rate hot, 26.5 amp. 8.0 volts and 4200 r.p.m. Cut-out relay closes at 6.7 volts and opens at 0 to 3 amp. Generator equipped with voltage regulator.

### Starter

Delco Remy model 727-V-4p. Lock torque 16 ft. lb. at 3 volt and 600 amp. Running free at 5500 r.p.m. at 65 amp. at 5 volt. Starter engagement by solenoid operated gear.

### Wheel Alignment

Caster ¼ to 1 deg. Camber ¼ to 1 deg. Toe-in 1/32 to 3/32 in. King pin inclination 4 deg., 51 min.

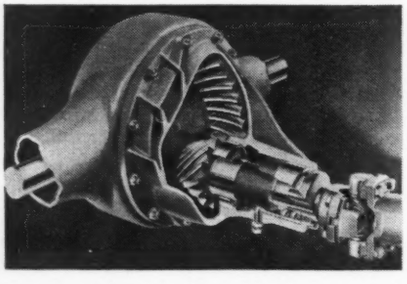
### Brakes

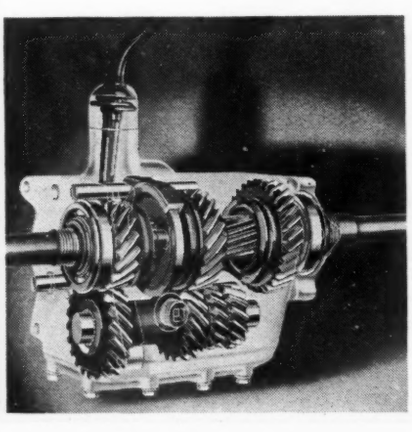
Hydraulic with .010 in. clearance at heel and toe. 12 in. drums. Total length of lining per wheel 25⅞ in. x 2 x 3/16 in.

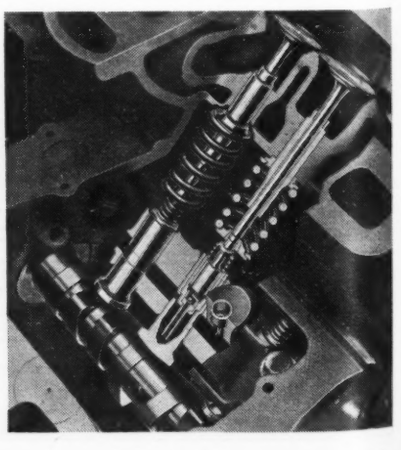
To adjust, jack up all four wheels, loosen eccentric lock nut and turn eccentric in direction of wheel forward rotation until .010 in. feeler gage is snug at each end of secondary shoe. Tighten lock nut. Expand brake shoes by turning adjusting wheel until drag is felt on brake drum. Adjust parking brake cables so clevis pin will just enter cross shaft levers. Now back off on adjusting wheel to free drums of all drag.

### Rear Axle

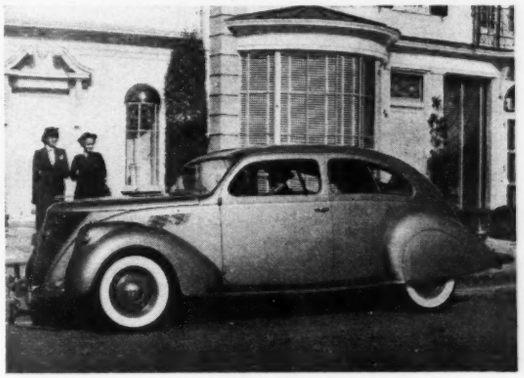
Own make semi-floating with hypoid reduction gears, with 12 teeth on pinion and 47 teeth on ring gear. Final reduction ratio 3.92 to 1. Pinion adjusted by means of shims. Use special hypoid lubricant. Backlash .006 in. Lubricant capacity 5 pints.







# Lincoln-Zephyr



### Engine

V-12, 2¾ x 3¾ in. 75 deg. V, 120 deg. crankshaft. Firing order, 1-4-9-8-5-2-11-10-3-6-7-12. Compression ratio 6.7 to 1. Compression pressure 105 lb. at cranking speed, throttle wide open, and spark plugs removed.

### Carburetor

Stromberg model EE-1. Main body with 31/32 in. venturi, No. 65 high speed bleeder and No. 40 idle air bleeder. No. 32-36 main discharge jet. Metering jet .046 in. Economizer setting: Pump piston to rest on seat of by-pass jet (less over travel) with throttle valve cracked open with a 19/64 in. drill. Fuel level 15/32 in. below top face of float chamber at 3 lb. fuel pressure.

### Distributor

Own make. Centrifugal advance with vacuum retard. Automatic advance starts at 450 to 500 r.p.m. Maximum advance 20 deg. at 3000 r.p.m. of engine. Breaker point gap .014 to .016 in. Breaker arm spring tension 20 to 24 oz.

### Ignition Timing

Breaker points should open 4 deg. or approximately 1¼ flywheel teeth before top center. Distributor can only be installed in correct position. Stationary points fire left bank of cylinders and movable points fire right bank of cylinders. A slotted screw on right side of distributor permits a small range of advance and retard. Loosen screw and move plate upward to advance spark. Each graduation on plate represents 2 deg. Removing plate and screw, uncovers movable screw for synchronizing movable points. Turning screw in, advances points while turning out retards points.

### Spark Plugs

Standard equipment Champion No. J-9, 14 mm. Correct gap .028 to .030 in.

### Valves

Intake and exhaust valve tappet clearance for operating .013 in. with the engine cold. Intake and exhaust valve head diameter 1.537 in. Valve stem diameter .3105 in. Intake and exhaust valve seat angle 45 deg. Valve lift .292 in. Exhaust valve seat inserts of high tungsten chrome alloy steel. Valve spring length 2.42 in. Valve spring pressure valve closed 32 to 36 lb. Valve spring pressure valve open 62 to 66 lb.

### Valve Timing

Intake valve opens 19½ deg. or 6 flywheel teeth before top center and the exhaust valve closes 16½ deg. or 5 flywheel teeth after top center. When installing new timing gears, the marked tooth on the crankshaft gear should mesh with the marked tooth on the camshaft gear.

### Pistons

Cast alloy steel, weighing 11.50 oz. without pin or rings. Weight with pins and rings 14.68 oz. Rod and piston assemblies are removed through the top of the block.

### Connecting Rods

Bearings are of the copper lead alloy steel backed type, with internal and external bearing surfaces. Internal diameter 2.128 in., outside diameter 2.298 in. Length on crankpin .787 in. Clearance on crankpin .0015 to .003 in.

### Main Bearings

Copper lead steel backed interchangeable type. Main bearing diameter 2.40 in. Lengths front 1.839 in., second 1.375 in., third 1.375 in., rear 2.254 in. Clearance .001 to .003 in.

### Battery

Ford make, 100 amp. hr., at 20 hr. rate, 17 plate. Positive terminal grounded.

### Generator

Own make, two pole type, third brush regulated. Move third brush in direction of armature rotation to increase charging rate. Maximum charging rate hot, 15.0 amp. at 7.0 volts and 1800 r.p.m. maximum charging rate cold 26.0 amp. and 1800 r.p.m. Cut-out relay closes at 7 volts (10 m.p.h.) and opens at 3.0 amp.

### Starter

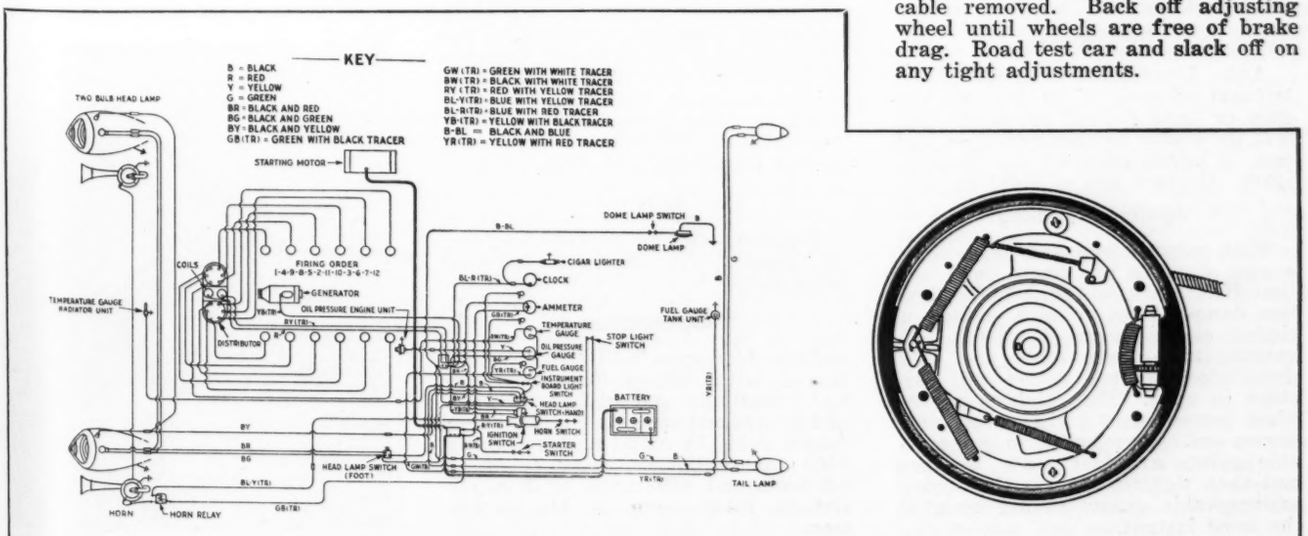
Own make. 100 r.p.m. cranking speed. Stall torque 14.0 ft. lb. Current to crank engine 225 amp. at 4.75 volts. Bendix type of starter engagement.

### Wheel Alignment

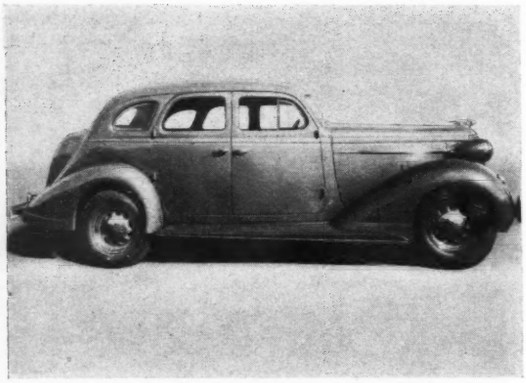
Caster 4 deg. with car loaded. Camber ¾ deg. Toe-in 3/16 in. Sideways inclination of king pin 4 deg.

### Brakes

Two shoe, single anchor, mechanically operated with hand brake operating on all four wheels. Diameter of brake drum 12 in. Molded lining used. Brake lining per wheel 23.9 x 1¾ x .21 in. To adjust, jack up all four wheels, release hand brake and disconnect cables from cross shaft. Loosen eccentric lock nut and turn eccentric adjustment in direction of wheel forward rotation until slight drag is felt, then back off until wheel is free. Expand shoes by turning notched adjusting wheel until wheels can just be turned by hand. With shoes expanded, adjust cable lengths so that clevis pins will just enter holes, with all slack in cable removed. Back off adjusting wheel until wheels are free of brake drag. Road test car and slack off on any tight adjustments.



# Nash



## Ambassador Eight

### Engine

Eight cylinder 3⅛ x 4¼ in. Firing order 1-6-2-5-8-3-7-4. Compression ratio 5.64 to 1. Compression pressure 90 lb. at 125 r.p.m., or cranking speed.

### Carburetor

Stromberg EE-1. Fuel for idle speed is taken through idle tube 5 where it is mixed with air from bleeder at top of idle tube. Mixture passes to idle channel where additional air blends with it through secondary idle air bleeder. Mixture is then discharged through idle holes 14. Idle needle valves 13 control fuel. Turn in for lean and out for rich mixtures. Adjust one carburetor barrel at a time, preferably disconnecting spark plug leads to cylinders not supplied by barrel being adjusted. Main discharge jet is shown at 3 and main metering jet is shown at 12. High speed bleeder is at 4. Fuel supplied through main metering jet 12 up to speeds of 65 m.p.h., above that speed economizer valve is forced down by accelerating pump piston allowing fuel to flow through economizer valve. Fuel level is 13/32 in. below top surface of float chamber with the engine idling. Two adjustments are provided for accelerating pump. Use long stroke for cold weather driving.

### Distributor

Auto Lite model IGK-4101. Centrifugal advance of 30 deg. No vacuum or hand control provided. Unit is of the double breaker arm type, both sets of points open at the same instant. Correct gap is 0.022 in.

### Ignition Timing

With points clean and adjusted to a gap of 0.022 in., crank engine so that IGN mark on crankshaft vibration damper lines up with pointer on timing case. Loosen distributor advancing arm clamp screw and shift distributor so fixed points will just start to open. Then tighten clamp. Then loosen movable point plate screws and shift subplate so that movable points are just ready to open and then tighten screws. Stationary and movable points should open at the same instant.

### Spark Plugs

Standard equipment AC model K-12, 14 mm. Correct gap is 0.022 in.

### Valves

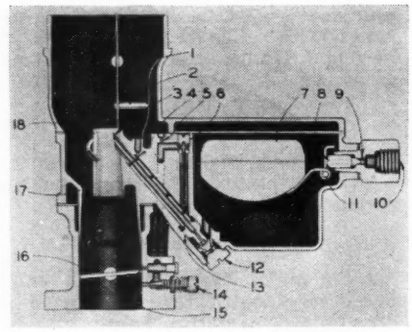
Operating tappet clearance, intake 0.008 in., exhaust 0.015 in. Adjustments made with engine warm and running. Intake valve head diameter 1.65 in. Exhaust valve head diameter 1.46 in. Intake and exhaust valve seat angle 45 deg. Intake and exhaust valve stem diameter 0.372 in.

### Valve Timing

With intake valve adjusted to 0.008 in. and the exhaust to 0.015 in., the intake valve should open 15 deg. before top center. When installing a new timing chain, the punch marks on the crankshaft and camshaft sprockets should be brought together and in line with the centers of the two shafts.

### Connecting Rods

Rod bearings are of the steel backed babbitt lined interchangeable type. Rod bearing diameter 2 in., length 1 15/64 in. Clearance 0.002 in., end play 0.010 in. Rod and piston assemblies are removed through the bottom of the cylinder block. Install rods with trade-mark toward front of the engine.




### Main Bearings

Nine main bearings 2 31/64 in. in diameter. Bearings 2, 4, 6 and 8 are 13/16 in. long. Front 1½ in. long, No. 3, 1 1/16 in., No. 5, 1⅝ in., No. 7. 1 1/16 in., No. 9, 2 5/32 in. Clearance 0.002 in. End play 0.004 in. Bearings are of the babbitt lined steel backed interchangeable type.

### Battery

Standard equipment 116 amp. hr., 15 plate USL. Positive terminal grounded.

### Generator

Auto Lite type GCD-4802. Shunt wound with voltage regulator control. Maximum output hot, 28 amp. at 8.0 volts and 1800 r.p.m. Maximum output cold, 18 amp. at 8 volts and 1650 r.p.m. Cut-out relay closes at 7.2 volts and 850 r.p.m. or 9 m.p.h. Cut-out relay opens at 1½ to 2½ amp.

### Starter

Auto Lite model MAB-4054 equipped with coincidental starter switch. Operated by pressing down on clutch pedal and when engine starts, a vacuum switch releases the switch and keeps starter out of operation. Be sure to readjust starter cable after each clutch adjustment. Starter switch should engage just after the clutch pedal is depressed just enough to disengage the clutch. Adjustment of spring should not be changed. Adjust cable at clamp. Lock torque of starter 167 amp. at 5.0 volts. Running free starter draws 50 amps. at 6.0 volts.

### Brakes

Bendix, two shoe, single anchor, hydraulically operated. Drums 11 in. in diameter. Brake lining per wheel 23 13/16 in. x 2¼ in. x 3/16 in. To adjust, jack up all four wheels, loosen eccentric lock nut and turn eccentric in direction of wheel forward rotation until a 0.010 in. feeler gage is snug, between secondary (rear) shoe and drum. Tighten lock nut. Expand shoes by means of notched adjusting wheel until heavy drag is felt, then back off until wheels are free.

### Steering

Gemmer worm and roller type. To adjust, jack up front wheels and turn steering one turn to right from central position. To remove end play from steering column, loosen four form cover screws and remove one shim. Tighten cover screws and check. If play still exists, remove another shim. To remove roller shaft end play, turn steering wheel to either extreme and then back ⅛ turn. Loosen adjusting screw lock nut on inner end of shaft and turn screw right hand. Tighten lock nut. To remove backlash between worm and roller it is necessary to remove steering assemble from car. Remove roller shaft and remove shims as necessary until no backlash is present with roller in center of worm. Caster 2 deg. Camber 1½ deg., toe-in not to exceed ⅛ in. King pin inclination 7 deg.

# Nash

## Engine

Six cylinder, 3⅜ x 4⅜ in. Compression ratio 5.67 to 1, compression pressure 100 lb. at 125 r.p.m. of engine (cranking speed), with the plugs out and throttle wide open. Firing order 1-5-3-6-2-4.

## Carburetor

Stromberg EX-32. Idle adjustment, turn out for rich mixture and in for lean. Calibration: No. 44 idle air bleeder; main body 1 3/16 in. venturi No. 70 high speed bleeder. No. 61 pump discharge nozzle. Main discharge jet No. 32. Fuel level ¾ in. below top face of float chamber at 3 lb. fuel pressure. Accelerating pump, use short stroke for warm weather and long stroke for cold weather.

## Distributor

Auto Lite model IGE-4012-B. Centrifugal advance of 18 deg. No manual or vacuum advance provided. Breaker point gap .022 in. Distributor is of the double breaker arm type. Both points should open at the same instant.

## Ignition Timing

With points clean and adjusted to .022 in. gap, crank engine until DC/IGN mark on vibration damper lines up with pointer. At that point the stationary points should just open. Then without cranking engine, shift movable points so that they open at this same point. Firing order 1-5-3-6-2-4.

## Spark Plugs

Standard equipment AC type K-12, 14 mm. Correct gap .022 in.

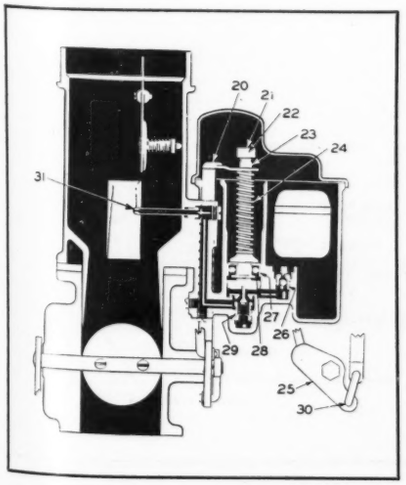
## Valves

Operating tappet clearance .008 in. for intake and .015 in. for exhaust. Adjustments made with engine hot. Valve head diameter, intake 1.75 in., exhaust 1.59 in. Intake and exhaust valve seat angle 45 deg.

Valve stem diameter .372 in.

## Valve Timing

With intake and exhaust tappets set to .008 in. and .015 in. respectively, intake valve opens 24 deg. before top center. When installing a new timing chain, punch marks on camshaft and crankshaft gears should be brought together and in line with the centers of the shafts.




## Pistons

Bohn aluminum with split skirt and strut. Rod and piston assemblies are removed through the top of the block. Full floating wrist pin ⅞ in. in diameter.

## Connecting Rods

Rod bearings are of the steel backed babbitt lined type, 2 in. in diameter and 1 27/64 in. long. Clearance .002 in., end play .010 in. Rod and piston assemblies are removed through the top of the block.

## Main Bearings

Bearings are of the steel backed, babbitt lined, interchangeable type. Seven main bearings 2 31/64 in. in diameter. Lengths front 1¼ in., second 15/16 in., third 15/16 in., fourth 1⅞ in., fifth 15/16 in., sixth 15/16 in., rear 1⅝ in.

## Battery

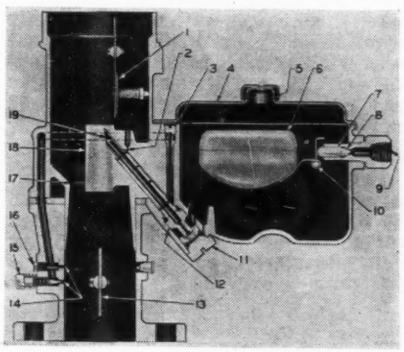
Standard equipment 100 amp. hr., 13 plate USL. Positive terminal grounded.

## Generator

Auto Lite model GCM-4803-4. Maximum charging rate cold 18 amp. at 8 volt and 2800 r.p.m. Maximum charging rate hot, 18 amp. at 8 volt and 2800 r.p.m. Cut-out relay closes at 7.5 volts and 775 r.p.m. and opens at 1½ to 2½ amp.

## Starter

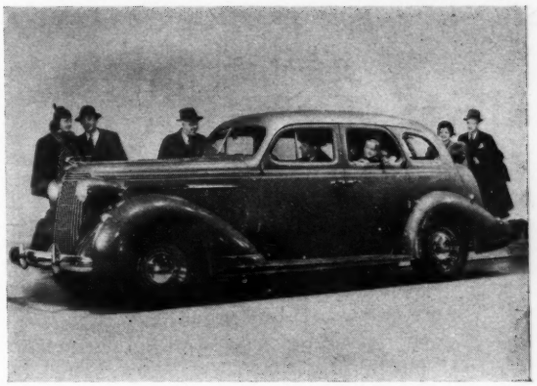
Auto Lite MAB-4076. Lock torque 167 amp. at 5 volts. Running free at 50 amp. and 6.0 volts. Bendix drive engagement.



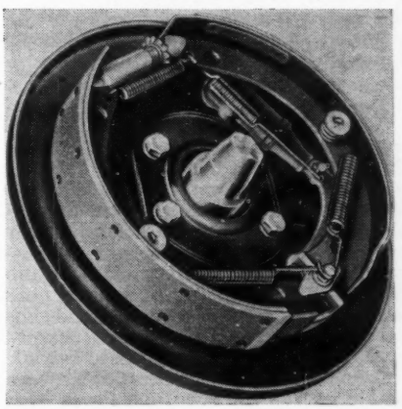

## Brakes

Hydraulic brakes operating in 10 1/16 in. drums. Clearance .010 in. at heel and toe. Lining 2 in. wide.

To adjust—jack up all four wheels, loosen eccentric lock nut and turn eccentric in direction of wheel forward rotation until a .010 in. feeler gage is snug at top and bottom of secondary shoe. Tighten eccentric lock nut and expand notched adjusting wheel until heavy drag is felt on drum, then back off on adjusting wheel until wheels are free. To adjust hand brake—expand shoes in drums by turning notched adjusting wheels until shoes are tight in drums. Loosen hand brake bracket-to-frame screws and pull hand brake into third notch from rear of sector. Shift bracket forward until the cables are tight and then tighten



**Ambassador Six**



frame screws securely. Release hand brake and check adjustment of rear wheel shoes.

## Wheel Alignment

Caster 2½ deg., camber 1½ deg. Toe-in ⅛ in. maximum. King pin inclination 7.0 deg.

## Steering

Gemmer worm and roller. To adjust worm bearing—disconnect drag link and then loosen worm cover screws ⅛ in. and remove one shim at a time, between inspections to remove end play. Correction of gear misalignment — loosen frame bracket bolts just enough to permit gear to shift in frame to line up at angle determined by height setting of instrument board gear bracket and then retighten frame bracket bolts. Next loosen instrument board gear bracket and allow it to shift to match column position and then retighten. To adjust roller shaft mesh in worm—remove roller shaft adjustment screw lock nut which is on engine side of gear case. Slide off lock plate far enough to clear lock boss on roller shaft cover. Then with steering wheel in mid-position and drag link disconnected, tighten roller shaft adjustment screw, just enough to remove play. Slide lock plate into position and replace lock nut.

# Oldsmobile

## Six Cylinder

### Engine

Starting Serial No. F-372,001, Engine No. F-670,001. Six-cylinder, 3 7/16 x 4⅛. Firing order 1-5-3-6-2-4. Compression ratio 6.1 to 1. Compression pressure 146 lb. at 1000 r.p.m.

### Carburetor

Carter carburetor No. 351S. Metering rod adjustment: Use tool No. T109-25. Anti-percolator adjustment: After setting metering rod, back out throttle lever adjusting screw. Then, with throttle valve tightly closed, adjust lip on pump arm to depress anti-percolator stem to indicator line flush with top of anti-percolator plug. Install air horn and climatic control assembly and then fast idle cam with attaching screw. Fast idle adjustment: Adjust fast idle link so there is ⅝ in. clearance between inside wall of air horn and lower edge of choke valve with throttle lever adjusting screw locked against first step on fast idle cam. Adjustment for unloader: At wide-open throttle adjust cam on throttle lever to give ⅜ in. clearance between lower edge of choke valve and wall of air horn. Lock out adjustment for choke: With throttle and choke valves wide open, adjust lip on fast idle link to give 1/32 in. clearance between lip and throttle lever lock. Automatic throttle adjustment: A clearance of .070 in. should exist between the throttle lever adjusting screw and fast idle cam and pin assembly when starter pedal is in full down position. To obtain this, proceed as follows: Disconnect starter cable from starter switch. Place starter shift lever in full down position. Loosen lock nut on eccentric pin in starter operating lever. With offset screwdriver adjust eccentric lever until there is .070 in. between the throttle adjusting screw and fast idle cam and pin assembly. This adjustment is made only after the 6-m.p.h. idle is obtained.

### Distributor

Delco-Remy Model 647-F. Single breaker type, automatic advance with vacuum control. Proper gap is .020 in.

### Ignition Timing

Clean and adjust breaker points to .020-in. gap. Set distributor so that No. 1 spark plug fires when steel ball in flywheel lines up with pointer at timing hole in left side of flywheel housing. Ignition occurs at top center.

### Spark Plugs

Standard equipment is AC 14 mm. type K-9. Proper gap is .040 in.

### Valves

Operating valve tappet clearance, intake, .008 in., exhaust .011 in.

### Valve Timing

Adjust intake valve tappet clearance to .0125 in. and insert feeler gage to detect opening point. Intake valve opens 5 deg. or 2 flywheel teeth before top dead center, and exhaust valve closes 5 deg. or 2 flywheel teeth after top dead center. When installing new timing chain, punch marks on cam and crankshaft sprockets should be brought together and in line with shaft centers.

### Steering

Saginaw, worm and roller. To adjust, disconnect drag link at pitman arm, and jack up front wheels. Follow instructions for Oldsmobile 8.

### Front Axle

Independent suspension. Caster 0 to ¾ deg. negative. Camber ⅛ to 1 deg. Toe-in. ⅛ to 3/16 in. King pin inclination 4 deg. 51 min. To adjust caster, loosen steering knuckle support clamp bolt and remove lubrication fitting from front bushing of eccentric pin in upper control arm. Insert Allen wrench and turn pin in clockwise direction to increase caster, counterclockwise to decrease. Camber is controlled by same pin, and camber adjustment is performed in the same manner as caster adjustment. Toe-in is adjusted by first setting the front wheels straight ahead and then adjusting each tie rod the same amount to give the desired setting. Tread is 58 in.

### Connecting Rods

Remove from above. Bearings are removable, steel-backed, babbitt-lined. Install in engine with oil spray hole in upper half of bearing toward valve side. Bearings are fitted with .001 to .003 in. clearance.

### Battery

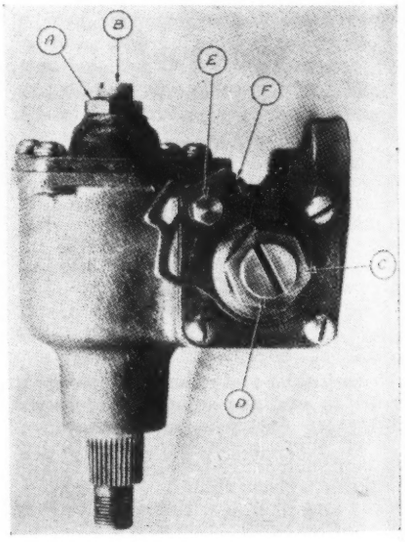
Delco-Remy Model 15-T; 15-plate, 94-ampere-hour capacity. Negative terminal grounded.

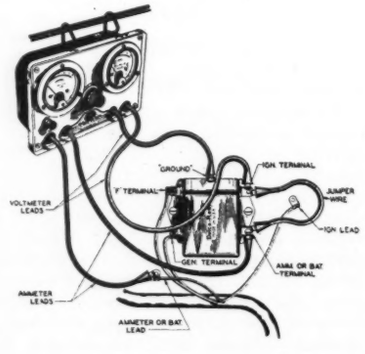
### Generator

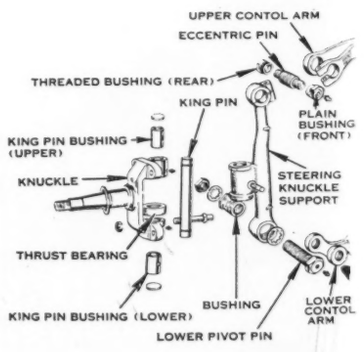
Delco-Remy Model 936-T. Non-adjustable third brush. Output controlled by voltage regulator. To check output, disconnect lead from "BAT" terminal of regulator and connect positive ammeter lead to terminal, connecting negative lead to wire removed from terminal. Connect positive voltmeter lead to "BAT" terminal of regulator, and negative lead to ground (oil cup on generator). Ground the "F" terminal of regulator and set the engine speed up to approximately 30 to 35 m.p.h. Adjust resistance in tester to show 8.2 volts when output reads 20 amperes. Maximum output is 26 amps. at 8.6 volts. To adjust voltage regulator see instructions for Oldsmobile 8.

### Starter

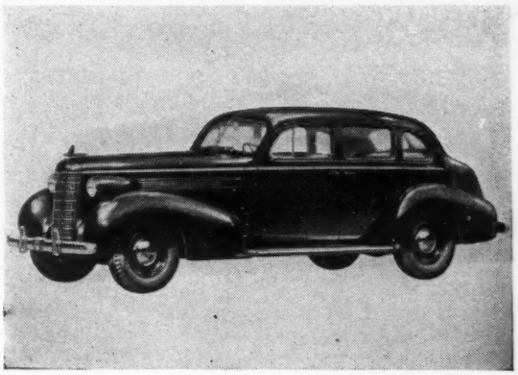
Delco-Remy Model 739-G. Drive through manually operated over-running clutch. Running free, current draw is 65 amps. and 5 volts at speed of 5000 r.p.m. With armature locked, current draw is 475 amps. and 3.6 volts, developing 12 ft. lb. of torque. Flywheel has 145 teeth.



# Oldsmobile



Eight Cylinder

## Engine

Starting Serial No. L-146001, Engine No. L-250,001. Eight cylinder, 3¼ x 3⅞ in. Firing order 1-6-2-5-8-3-7-4. Compression ratio 6.2 to 1. Compression pressure 152 lb. at 1000 r.p.m.

## Carburetor

Carter carburetor Models 345S—367S. Pump adjustment: With pump connector link in long stroke, adjust throttle connector rod by bending to give ¼ in. pump stroke. Travel can be checked by marking shaft at wide open position and at fully closed position and then gaging distance between marks. Metering rod adjustment should be made by using two gages No. T109-27. Anti-percolator adjustment: Back out throttle lever adjusting screw without disturbing metering rods or pump adjustment. With throttle valves tightly closed, adjust lips on anti-percolator arm to depress anti-percolator stem until indicator line is flush with top of anti-percolator plug. Care must be taken so that an even adjustment is made on both lips. Adjustment for unloader: With throttle wide open, distance between upper edge of choke valve and wall of air horn should be ¼ in. Adjustment can be made by bending lip on fast idle connector link. Fast idle adjustment: Hold choker valve tightly closed and adjust fast idle screw to give .018 in. opening between edge of throttle valve and bore of carburetor side opposite port. Automatic throttle adjustment: Disconnect starter cable from starter switch. Place starter shift lever in full down position. Loosen lock nut on eccentric pin in starter operating lever. With offset screwdriver, adjust eccentric lever until there is .070 in. between the throttle lever adjusting screw and the carburetor body casting. This adjustment is made only after the six m.p.h. idle is obtained.

## Ignition Timing

Clean and adjust breaker points to .015 in. gap. Adjust distributor so that No. 6 spark plug fires when steel ball in flywheel lines up with pointer at timing hole in left side of flywheel housing. Ignition occurs 2 deg. or ¾ flywheel teeth before top dead center.

## Spark Plugs

Standard equipment A. C. 14 mm. Type K-9. Proper gap is .030 in.

## Valves

Operating valve tappet clearance, intake .008 in., exhaust .011 in.

## Valve Timing

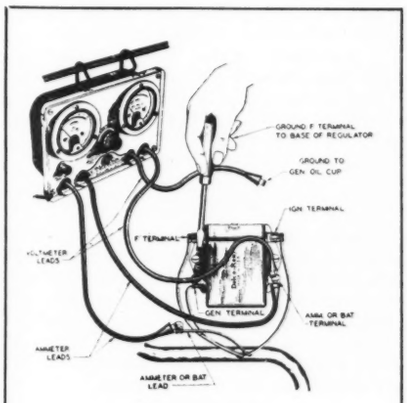
With intake valve tappet clearance set at .0125 in. and exhaust clearance at .0156 in., intake valve opens at top dead center, and exhaust valve closes 10 deg. or 4 flywheel teeth after top dead center. When installing timing chain, punch marks on cam and crankshaft sprockets should be brought together and in line with shaft centers.

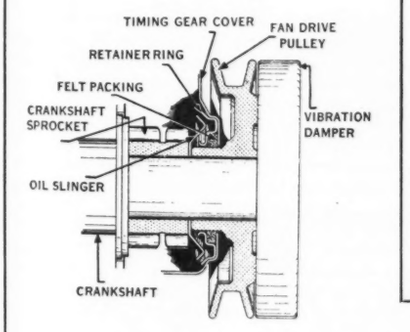
## Connecting Rods

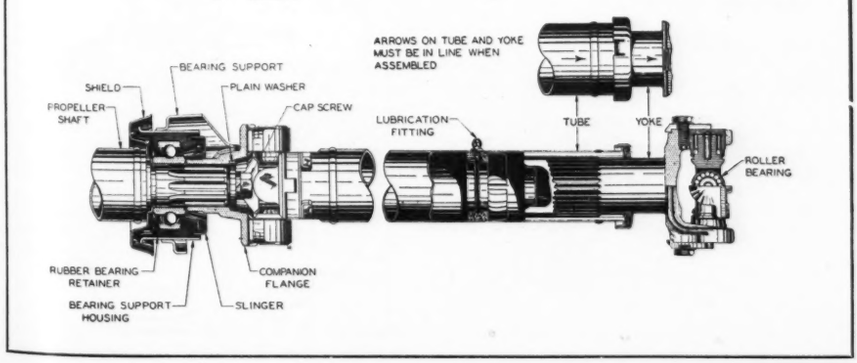
Remove from above. Bearings are removable, steel backed babbitt lined. Install in engine with oil spray hole in upper half of bearing toward valve side. Bearings are fitted with .001 to .003 in. clearance.

## Generator

Delco-Remy Model 936-T. Non-adjustable third brush. Output controlled by voltage regulator. To test output, see instructions for Oldsmobile 6. To check voltage regulator, disconnect wire from "IGN" terminal and connect the "IGN" terminal to the "BAT" terminal by means of a jumper wire. Remove wire from "BAT" terminal and connect it to the ammeter negative lead. Connect positive ammeter lead to "BAT" terminal. Connect positive voltmeter lead to "IGN" terminal of regulator, and negative lead to ground (regulator cover screw). Temporarily ground "F" terminal, and set engine speed up to generator output of 15 to 17 amps. Remove "F" ground, and adjust resistance in tester to show 6 to 10 amps. output. (If battery is fully charged it may be necessary to turn on lights to increase output.) With ammeter reading between 6 and 10 amps., voltage should be 7.4 to 7.6 volts. Voltage may be adjusted by bending the clip holding the lower end of the armature coiled spring. Increasing the spring tension increases the voltage.



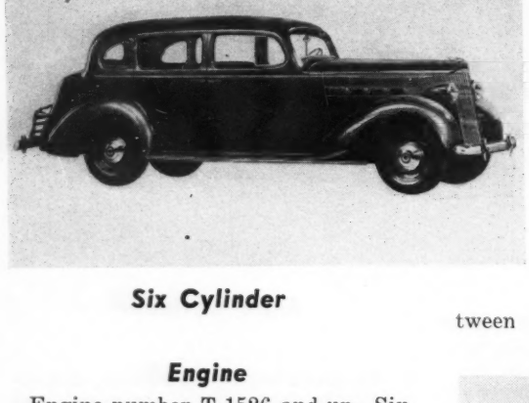

## Steering

Saginaw worm and roller. To adjust, jack up all four wheels and disconnect drag link at pitman arm. To remove pitman arm shaft end play, tighten the four round head screws that hold side plate cover to housing, and loosen lock nut "A." Turn screw "B" right hand until play is removed, and tighten lock nut. To remove worm shaft end play, loosen lock nut "C" and tighten adjusting screw "D" until a pull not greater than 1½ lb. is required to turn steering wheel to extreme positions, and then tighten lock nut. To remove backlash between worm and roller shaft, place steering gear in center position and tighten three round head screws holding end cover to housing. Loosen lock screw "E" and tap lash adjuster "F" lightly to move it in direction of arrow only enough to remove lash. Tighten lock screw and check pull required to turn steering wheel through center position. Pull not to exceed 2¼ lb.

## Front Axle

Independent suspension. Caster 0 to ¾ deg. negative. Camber ⅛ to 1 deg. King pin inclination 4 deg. 51 min. Toe-in ⅛ to 3/16 in. Tread is 58 in. For adjustment see Olds 6.

# Packard



## Six Cylinder

### Engine

Engine number T-1526 and up. Six cylinder 3 7/16 x 4¼ in. Firing order 1-5-3-6-2-4. Compression ratio cast iron head 6.3 to 1, compression pressure 105 lb. Aluminum head 6.75 to 1, compression pressure 115 lb.

### Carburetor

Chandler Groves (C-G) model AOC2. Turn idle adjusting needle out for richer mixture. Pump link should be in center hole for average conditions. Outer hole increases quantity of fuel discharged. Fuel level ½ in. below machined top surface of float bowl with 2½ to 3 lb. pressure on fuel. If mixture is too rich or lean during warm-up period, remove thermostat assembly. Choke valve should drop open freely. Clean choke valve or straight choke control rod if action is sticky but do not use any lubricant. Correct any friction in choke control rod and vacuum piston. If punch mark on thermostat housing is not aligned with punch mark on thermostat-plate, turn adjusting screw 31, until marks are aligned. If warm up mixture is still unsatisfactory, remove thermostat 32 and increase or decrease thermostat spring tension ½ graduation at a time.

### Distributor

Delco-Remy model 647-E single breaker type modified vacuum advance. Breaker point gap .015 in. Breaker spring tension 19 to 23 oz. Advance starts at 300 r.p.m. of distributor; 1¾ to 3¼ deg. at 600 r.p.m. Maximum advance of 9¼ to 10¾ deg. at 2000 r.p.m. with vacuum line disconnected. Vacuum advance starts with a vacuum of 6 in. to 7 in. and reaches a maximum of 7½ deg. (distributor) at 17 in.

### Ignition Timing

With breaker points clean and adjusted to .015 in. and fuel compensator set at zero, breaker points should open 2½ deg. to 4 deg. or one or two graduations on flywheel before top center. Engines with 7 to 1 compression ratio should be timed so that breaker points open 4 to 6 deg. or 2 to 3 flywheel graduations before top center.

### Spark Plugs

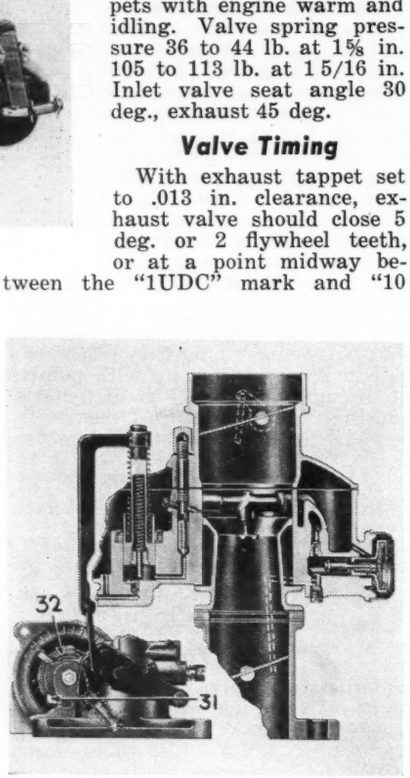
AC or Champion model Y-4. Size 10 mm. When tightening plugs use thumb and finger leverage on 4½ in. wrench. Correct gap .026 to .030 in.

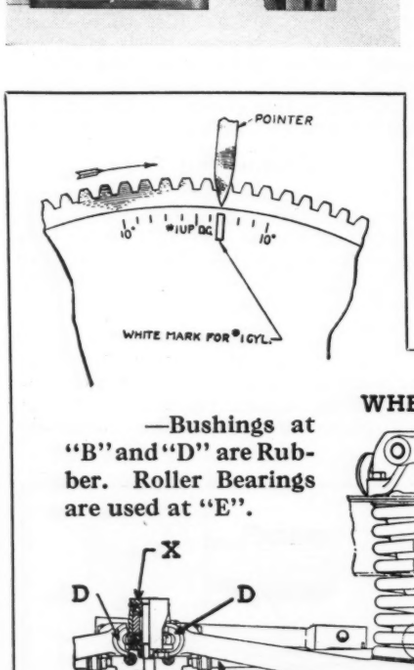
### Valves

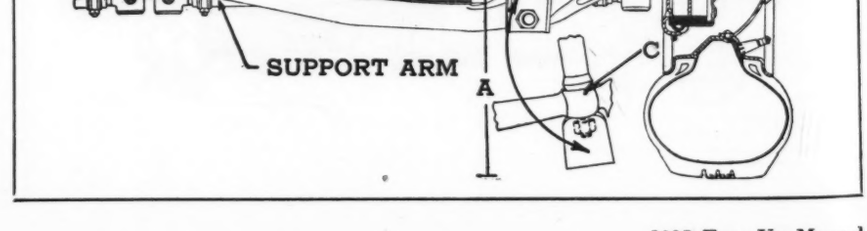
Operating tappet clearance—intake .007 in., exhaust .010 in. Adjust tappets with engine warm and idling. Valve spring pressure 36 to 44 lb. at 1⅝ in. 105 to 113 lb. at 1 5/16 in. Inlet valve seat angle 30 deg., exhaust 45 deg.

### Valve Timing

With exhaust tappet set to .013 in. clearance, exhaust valve should close 5 deg. or 2 flywheel teeth, or at a point midway between the "1UDC" mark and "10 deg." marks on flywheel, after top center. When installing new timing chain, punch marks on camshaft and crankshaft sprockets should be brought together and in line with the centers of the two shafts.




### Pistons

Autothermic cam ground type, tin plated. Clearance is correct when it requires 12 to 18 lb. to withdraw a .0015 in. feeler ½ in. wide from between the non-slotted side of the piston and the cylinder wall. Rod and piston assemblies are removed through the top of the block.

### Generator

Delco-Remy 948-U. Non-adjustable third brush type. Maximum output 18 amp. at 8 volt with generator hot. Motoring free 600 r.p.m. at 4.5 amp. and 6 volts. Field current 2.5 amp. at 6 volts. If generator does not charge make sure regulator has good electrical ground on dash. Ground regulator "F" terminal temporarily. Run engine at approximately 25 m.p.h. If generator now charges, regulator is probably at fault. If generator does not charge on this test, remove lead from the regulator "GEN" terminal and strike it against ground with "F" terminal still grounded. If a spark occurs, regulator is at fault. If no spark occurs generator is at fault. When removing regulator, disconnect "F" terminal first. When installing regulator, mount the unit on the dash before connecting any leads. When attaching leads, connect "F" terminal last. If these precautions are not followed, regulator will be injured.

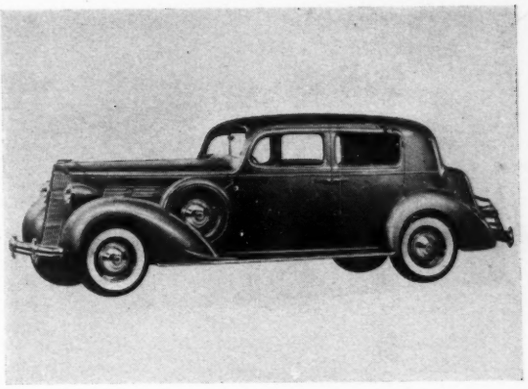
### Steering

Toe-in 1/32 to ⅛ in. both tie rods must be the same length. Camber 1 deg. Adjusted by installing proper offset pilot thimble at upper end of wheel vertical support arm. Caster 2½ deg. Adjusted by installing tapered shims. All measurements must be made with car fully loaded.

### Oil Pump

Install engine oil pump with driving slot parallel with center line of camshaft, with distributor rotor lined up with No. 1, cap terminal.

# Packard



**Model 120**

### Engine

Serial No. X-100026 and up. Eight cylinder 3¼ x 4¼. Compression ratios 6.43 to 1, with 7 to 1 optional. Compression pressures 110 and 118 respectively. Firing order 1-6-2-5-8-3-7-4.

### Carburetor

Stromberg EE-14. Turn idle adjusting screws 23, out for richer mixture. Idle adjusting screws control fuel. Fuel level 15/32 in. below machined top surface of float bowl with 2½ to 3 lb. fuel pressure. Metering jet .047 in. Economizer No. 63 drill. Pump nozzle No. 65 drill. High speed bleeder No. 65 drill. Main discharge jet No. 32-36 with six No. 58 and four No. 52 side holes. If mixture is too rich or lean during warm-up period disconnect link "G." Choke valve should drop open without lag. Clean choke valve shaft if sticky but do not oil. Remove thermostat "D." If pointer on inner plate is not aligned with punch mark (10 or 11 graduations rich) turn screw "M" until aligned. Correct any friction in movement of piston 24 and lever "L." Then reinstall on manifold and adjust lever "L" 1/16 in. away from stop "M" when choke valve is fully closed. If warm-up mixture is still unsatisfactory, remove thermostat and increase or decrease tension one graduation at a time until choking mixture is correct.

Some models fitted with Carter model 366S, type WD-O. Turn idle adjustment out for richer mixture. Standard adjustment of fast idle is .018 in. opening between throttle valve and ported side of body with choke closed. Float level ⅛ in. plus or minus 1/64 in. measured from the flange of the float bowl to the float with the assembly held upside down. Main nozzles should be installed with flat side up. Be sure copper washer is seated before installing nozzles. Trade mark "C" on throttle valves should face down and toward idle port side.

### Distributor

Auto Lite IGT-4004. Centrifugal advance 10 deg. Vacuum advance 7½ deg. Breaker point gap .012 to .018 in. Breaker spring tension 18 to 20 oz. Governor advance starts at 350 distributor r.p.m., is 4¼ to 5¾ deg. at 1250 r.p.m. and reaches maximum of 9¼ to 10¾ deg. at 2200 r.p.m. of distributor with vacuum disconnected. Heavier governor spring must be mounted on spring lug that has flat auxiliary spring back of it. Vacuum advance starts with a vacuum of 6 to 7 in. and attains a maximum of 7½ distributor deg. at 18 in. of mercury.

### Ignition Timing

With points adjusted to .015 in. and fuel compensator set at zero, breaker points on engines with standard compression ratio should open 7 deg. or 3½ graduations on flywheel before upper dead center. On engines with 7 to 1 compression ratio, breaker points should open 4 deg. or 2 flywheel graduations before the "1UPDC" mark on flywheel.

### Spark Plugs

AC or Champion model Y-4. 10 mm. Plugs should be tightened with thumb and finger leverage on a 4½ in. wrench. Correct gap .026 to .030 in.

### Valve Tappet Clearance

With engine warm and idling set intake tappet to .007 in. and exhaust to .010 in.

### Valve Timing

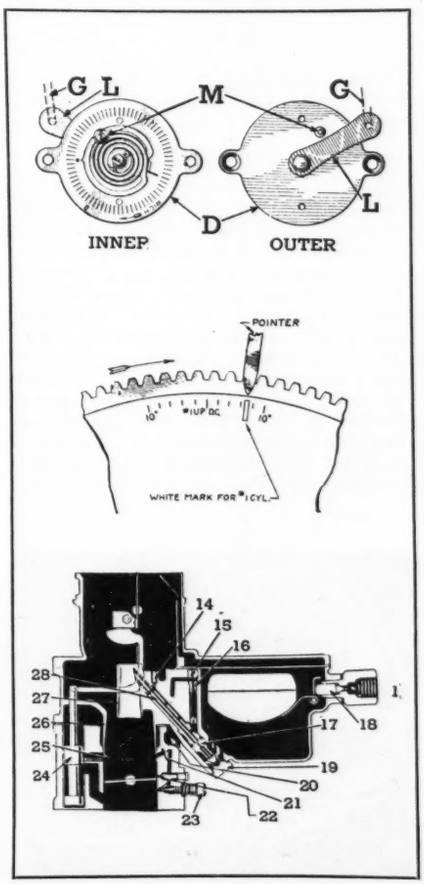
With exhaust valve tappet set to .013 in. exhaust valve should close 5 deg. or 2½ flywheel graduations after the "1UPDC" mark passes the timing pointer. When installing new timing chain, punch marks on camshaft and crankshaft gears should be brought together and in line with the centers of the shafts.

### Pistons

Strut type aluminum. Skirt clearance is correct when it requires 8 to 11 lb. pull on a .0015 in. feeler inserted at non-slotted thrust face of piston. Pistons removed through the top of the block.

### Bearings

Rod and piston assemblies removed through the top of the block. Rod and main bearings are of the shimless, precision, steel backed babbitt lined type. Bearings should not be adjusted. Both main and rod bearings are replaceable from below after removing bearing caps.




### Battery

Standard equipment 114 amp. hr., 17 plate Prest-O-Lite HiLevel. Positive terminal grounded.

### Generator

Auto Lite GCJ-4801-A. Third brush type. Maximum charging rate 25 amp. at 8 volts. Motoring free 4.4 amp. at 6 volts.

### Starter

Auto Lite MAX-4006. Bendix drive. Lock torque 16.5 ft. lb. at 3 volts and 640 amp. Running free 65 amp. and 5.5 volts 5300 r.p.m.

### Wheel Alignment

Toe-in should be 1/32 to ⅛ in. Both tie-rods must be same length. Camber 1 deg. adjusted by installing the proper offset pilot thimble at upper end of wheel support arm. Caster 2½ deg. Adjusted by installation of tapered shims at outer end of lower control arm. Measurements must be made with car loaded. (375 lb. on rear seat and 300 lb. on front seat.)

### Rear Axle

Hypoid reduction gears. Do not use kerosene to flush out housing. Use only approved hypoid or E.P. lubricants. Pinion bearings should be preloaded to 25 to 30 in. lb., by tightening flange nut until it buckles the spacer. Differential side bearings should be preloaded to a .010 to .012 in. spread of the bearing support pedestals.

### Brakes

Necessary to remove wheels for access to drum ports. To adjust, release hand brake, adjust lower end of rear shoe to .010 in. clearance by means of eccentric. Then adjust upper end of same shoe to .010 in. clearance by means of eccentric anchor. Turn star wheel adjuster until slight drag is felt, then back off until wheel is free. Repeat on other wheels. The heavier, yellow anchor spring is hooked to secondary spring; aluminum-colored spring is hooked to primary shoe. Springs must clear shoes at top. Front wheel cylinders are 1 1/16 in., rear 15/16 in., master cylinder 15/16 in.

# Plymouth

### Engine

Six cylinder 3⅛ x 4⅜ in. The letter "A" with the engine number indicates special standard bore which is .020 in. larger than standard. The letter "B" indicates main and rod bearings which are .010 in. undersize. Compression ratio 6.70 to 1. Approximate compression pressure 114 lb. at cranking speed.

### Carburetor

Carter Model C6F1, C6F2, C6F3, C6F4, C6F5. Flange size 1¼ in. S.A.E. Throttle bore 1 7/16 in. Main Venturi 1¼ in. Idle orifice tube jet size .0276 in. Float setting—top of float 5/64 in. below top of surface of carburetor body casting. Accelerating pump has three settings, use short stroke for summer. Main metering jet calibrated to flow 262 to 266 cc. per min. Set idle adjusting screw ½ to 1½ turns open. Turn out for richer mixture.

Plymouth Commercial models are fitted with a Chandler and Groves carburetor type A-2 carburetor. Details are similar to unit used on Packard Six. Fuel level is 17/32 in. below top of bowl with gasket removed. Correct by bending float arms. Idle adjustment on side of carburetor body control fuel. Turn in to make mixture leaner. Approximate setting is ¾ turn off seat. If rich at idle check vacuum economizer valve 13. Three adjustments are provided for accelerating pump. Use center position for most conditions. For high altitude operation smaller metering jets are available.

### Distributor

Outo Lite model IGS-4003-B1. Adjust points to .020 in. Breaker springs should have 18 to 20 in. tension.

### Ignition Timing

After setting breaker points at .020 in. gap, set breaker housing so that points open when timing marks on crankshaft pulley line up with pointer on chain housing or when crankshaft is 4 deg. after top center or when piston is .007 in. after top center. To check automatic advance use of timing light directed on timing marks on crankshaft pulley. Then if throttle is suddenly opened wide, mark on pulley should advance 10 deg. Then if throttle is closed so as to maintain an engine speed of 25 m.p.h., spark should advance an additional 10 deg.

### Spark Plugs

Standard equipment Champion model J-8, 14 mm. Correct gap .025 in.

### Valves

Inlet tappets should be adjusted to .006 in., and exhaust to .008 in. for operating conditions.

### Valve Timing

Tappet clearance for checking valve timing—intake .011 in., exhaust .012 in. Intake valve opens 6 deg. or 2½ flywheel teeth or .015 in. piston travel after top center. Exhaust valve closes 8 deg. or 3¼ flywheel teeth or .027 in. piston travel after top center. When installing new timing chain, punch marks on crankshaft and camshaft sprockets should line up with the centers of the shafts.

### Pistons

The aluminum pistons should be fit so there is .0005 in. to .001 in clearance. Piston assemblies are removed through the top of the block.

### Connecting Rods

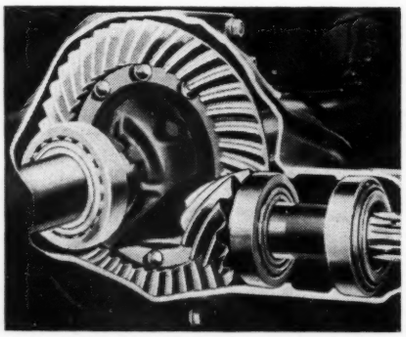
Rods should always be installed with the oil hole in the upper half of the bearing toward the valve side of the engine. Bearings are of the slip in type and should be installed so the small boss on the bearing lines up with the machined grooves in the rods in order to lock the bearing in place.

### Battery

Standard equipment 90 amp. hr., 13 plate, Willard. Positive terminal grounded.

### Generator

Auto Lite GBM-4604-C1. Third brush type. Moving third brush in direction of armature rotation increases charging rate. Maximum output with cold generator 18 amp. at 8.3 volts. To test voltage regulator connect accurate ammeter between terminal marked "B" and the lead removed from that terminal. Connect voltmeter across terminals "B" and "GD." Then with fully charged battery and engine running at 30 m.p.h. and generator warm the ammeter should show a reading below the maximum noted on the nameplate of the regulator and the voltage should show a reading between 7.4 and 7.8 volts.



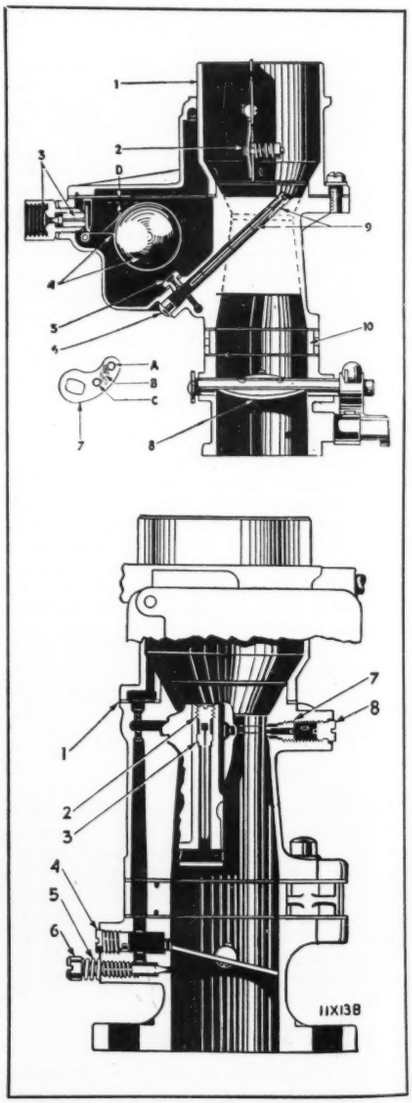
### Steering

Toe-in should be 0 to 1/16 in. Caster should be 2 deg. and camber ½ deg. King pin inclination 4½ to 5½ deg.

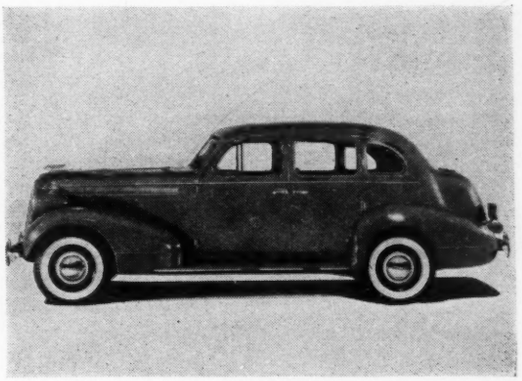
To adjust steering gear—Remove lubrication fitting and lock wire and turn plug in until spring is compressed solid, then back off to nearest cotter pin hole. Place road wheels straight ahead and steering wheel in mid-position. Remove cotter pin and nut from front of drag link ball and tap up and out. Loosen clamping bolt nut, being careful not to rotate steering wheel. Turn drag link end assembly until the length of the drag link is correct for installation without moving steering wheel or road wheels. Be sure to tighten clamping nut.

### Main Bearings

To replace main bearings—Remove oil pan, oil suction pipe, fan pulley, timing case cover. Then remove screw from timing case cover plate to oil pan front gasket oil seal plate which will permit the removal of the front bearing cap. Remove remaining bearing caps in usual manner. Upper bearing halves can be removed by rotating crankshaft.



# Pontiac



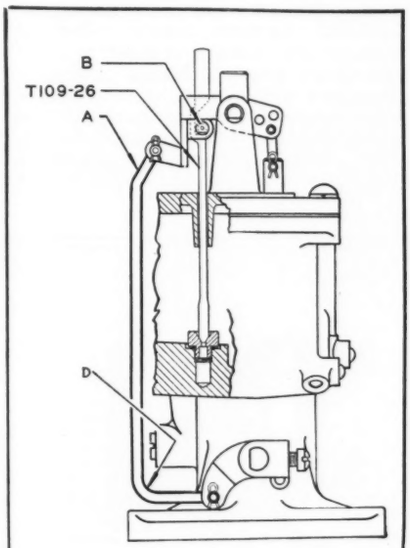
**Eight Cylinder**

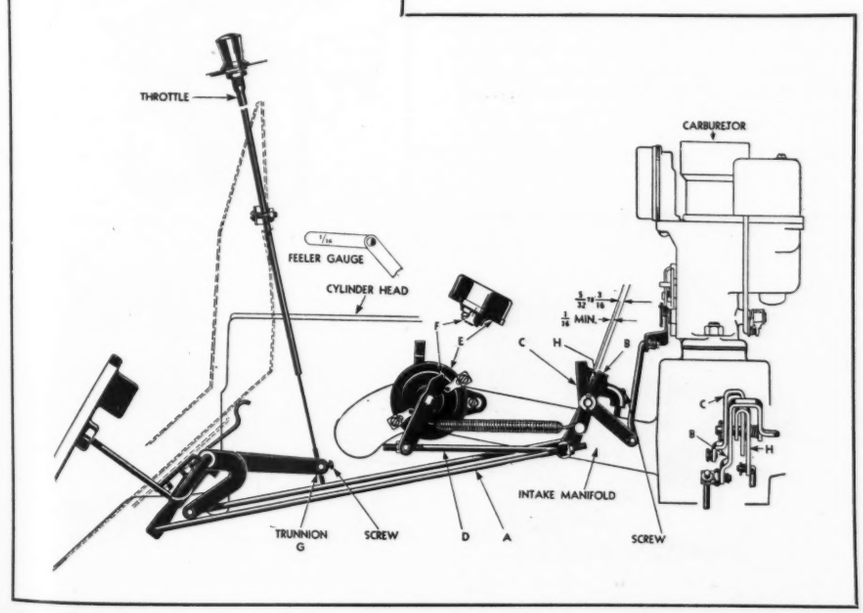
### Engine

Starting Serial No. 8 CA 1001, Engine No. 8-83001. Eight cylinder, 3¼ x 3¾ in. Firing order 1-6-2-5-8-3-7-4. Compression ratio 6.2 to 1. Compression pressure 140 lbs. at 1000 r.p.m.

### Carburetor

Carter carburetor Model 350S. Pump adjustment: With pump connector link in center hole, adjust throttle connector rod by bending to give 19/64 in. pump stroke. Metering rod adjustment should be made by means of gage No. T109-26. Anti-Percolator adjustment: Should be made after metering rod setting. Back out throttle lever adjusting screw. With throttle valve seated adjust lip on pump arm to depress anti-percolator stem so bottom of indicator line is flush with top of anti-percolator plug. Fast idle adjustment: Back out throttle lever adjusting screw. Hold fast idle cam in normal idle position. Tighten throttle lever adjusting screw to seat against fast idle cam above first step. Bend fast idle link on offset portion so there is ⅝ in. clearance between inside wall of air horn and lower end of choke valve with throttle lever adjusting screw locked against upper step on fast idle cam and throttle valve seated. Unloader adjustment: With throttle wide open, adjust cam on throttle lever to give ¼ in. clearance between lower edge of choke valve and wall of air horn. Lock out adjustment for choke: With throttle and choke valves wide open, adjust lip on fast idle link to give 1/32 in. clearance between lip and throttle lever lock. Lock must prevent choke valve returning to closed position.




### Distributor

Delco-Remy Model 663-X, single breaker type, automatic advance with vacuum control. Correct point is .018 in.

### Ignition Timing

Clean and adjust breaker point to .018 in. gap. Set gaselector pointer at zero and adjust distributor so that No. 1 cylinder fires when lower mark "IGN 1 & 8" on flywheel lines up with pointer on left side of flywheel housing. This is 6 deg. or 2¼ flywheel teeth before top dead center. Adjust gaselector to advance or retard ignition for best performance according to grade of fuel used.

### Spark Plugs

Standard equipment A. C. 14 mm., type K-7. Proper gap is .025 in. On radio equipped cars set gap at .022 in.

### Valves

Operating valve tappet clearance, intake and exhaust, .011 to .013 in.

### Valve Timing

Adjust valve tappets to .015 in. clearance and insert .003 in. feeler gage to detect opening and closing points. Intake valve opens 5 deg. or 2 flywheel teeth before upper dead center and exhaust valve closes 5 deg. or 2 flywheel teeth after upper dead center. When installing timing chain, marks on cam and crankshaft sprockets should be brought together and in line with shaft centers.

### Connecting Rods

Remove from above. Bearings are removable, steel backed babbitt lined, fitted with .005 to .0015 in. clearance.

### Generator

Delco-Remy Model 948-S. Non-adjustable third brush type, with voltage regulator. Red jewel light on instrument board lights when generator is not charging. See Pontiac Six for checking output. To adjust charging rate, remove voltage regulator cover and bend lower clip holding coiled spring to regulator armature. Bend clip down to increase voltage, up to decrease.

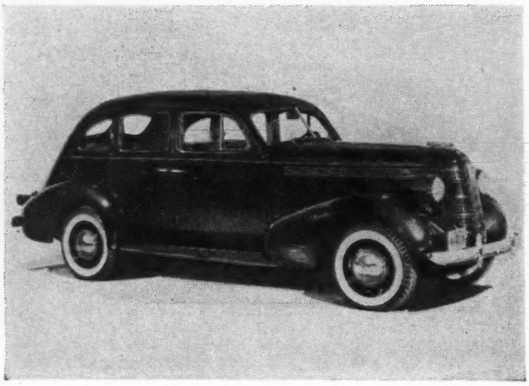
### Starter

Delco-Remy Model 727-S. Drive through solenoid-operated over-running clutch. Running free, current draw is 65 amperes at 5 volts and speed of 5500 r.p.m. With armature locked, current draw is 600 amperes at 3 volts, developing 15 ft. lbs. of torque. Flywheel has 139 teeth.

### Front Axle

Independent suspension, coil spring type. Caster minus ¼ to minus 1 deg. Camber ⅛ to 1 deg. King pin inclination 4 deg. 51 min. Toe-in, 0 to 1/16 in. Eccentric pin in upper control arm controls caster and camber. To adjust, loosen steering knuckle support clamp screw, remove the lubrication fitting from front bushing of eccentric pin and insert Allen set screw wrench to turn pin as required. Turning pin clockwise increases caster. One-half turn of pin changes camber to maximum high and low limits. One complete turn of pin changes caster 1 deg. and leaves camber constant. Tie-in is adjusted by turning each tie rod an equal amount after wheels have been placed in straight ahead position. Tread is 58⅜ in.

# Pontiac



## Six Cylinder

### Engine

Starting Serial No. 6 CA 1001, Engine No. 6-220001. Six-cylinder, 3 7/16 x 4 in. Firing order 1-5-3-6-2-4. Compression ratio 6.2 to 1. Compression pressure 140 lb. at 1000 r.p.m.

### Carburetor

Carter carburetor Model 352S. Pump adjustment: With pump connector link in center hole, adjust throttle connector rod by bending to give 19/64 in. pump stroke. Metering rod adjustment should be made by means of tool No. T109-26. Anti-percolator adjustment: Do not disturb metering rod adjustment. Back out throttle lever adjusting screw. With throttle valve seated, adjust lip on pump arm to depress anti-percolator stem so bottom of indicator line is flush with top of anti-percolator plug. Fast idle adjustment: Back out throttle lever adjusting screw. Hold fast idle cam in normal idle position. Tighten throttle lever adjusting screw to seat against fast idle cam above first step. Bend fast idle link on offset portion so there is ⅝ in. clearance between inside wall of air horn and lower end of choke valve, with throttle lever adjusting screw locked against upper step on fast idle cam and throttle valve seated. Unloader adjustment: With throttle wide open adjust cam on throttle lever to give ¼ in. clearance between lower edge of choke valve and wall of air horn. Lock out adjustment for choke: With throttle and choke valves wide open, adjust lip on fast idle link to give 1/32 in. clearance between lip and throttle lever lock. Lock must prevent choke valve returning to closed position.

### Distributor

Delco-Remy Model 647 D, automatic advance with vacuum control. Single-breaker type. Proper point gap is .018 in.

### Ignition Timing

Clean and adjust breaker points to .018-in. gap. Set gaselector pointer at zero and adjust distributor so that No. 1 cylinder fires when lower mark "IGN 1 & 6" on flywheel lines up with pointer on left side of flywheel housing. This is 6 deg. or 2¼ flywheel teeth before upper dead center. Adjust gaselector to advance or retard ignition for best performance according to grade of fuel used.

### Spark Plugs

Standard equipment AC, 14 mm., type K-7. Proper gap is .025 in. On radio-equipped cars set gap .022 in.

### Valves

Operating valve tappet clearance, intake and exhaust, .011 to .013 in.

### Valve Timing

Adjust valve tappets to .015 in. clearance and insert .003 in. feeler gage to detect opening and closing points. Intake valve opens 5 deg. or 2 flywheel teeth before upper dead center and exhaust valve closes 5 deg. or 2 flywheel teeth after upper dead center. When installing timing chain, marks on cam and crankshaft sprockets must be brought together and in line with shaft centers.

### Connecting Rods

Remove from above. Bearings are removable, steel-backed, babbitt-lined, fitted with .0005 to .0015 in. clearance. When installing rod bearings be sure that "tangs" in cap are on opposite end of crankpin from the tangs on the rod.

### Battery

Delco-Remy Model 15-P, 15-plate, 94-ampere-hour capacity. Negative terminal grounded.

### Generator

Delco-Remy Model 948 S. Non-adjustable third brush type, with voltage regulator. To check generator output, remove the wire from the "BAT" terminal of regulator and connect negative ammeter lead to this wire, and connect the positive ammeter lead to the "BAT" terminal. Connect the positive volt meter lead to the "GEN" terminal of regulator, and negative lead to a ground. Install a jumper wire from the "F" terminal of the regulator to a ground. Set engine speed equal to 30-35 m.p.h. With voltmeter reading 8.5 volts, ammeter should show a charge of 20 amperes or more. Maximum output is 22 amperes, cold.

### Starter

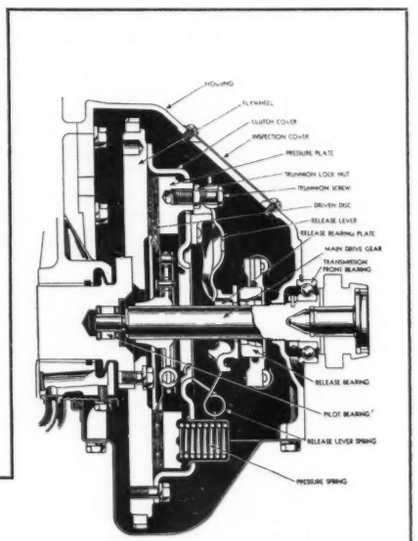
Delco-Remy Model 729 E, drive through manually operated over-running clutch. Running free, current draw is 65 amps. and 5 volts at speed of 5500 r.p.m. With armature locked, current draw is 600 amps. and 3 volts, developing 16 ft. lb. of torque. Flywheel has 139 teeth.

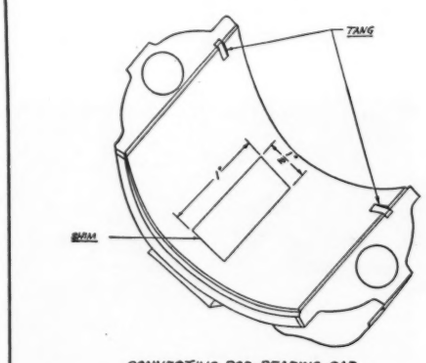
### Clutch

Own, single-plate dry disk. Adjust pedal stop screw to provide ½ in. clearance at under side of toe-board, and adjust linkage to allow ¾ in. free travel measured at pedal pad.

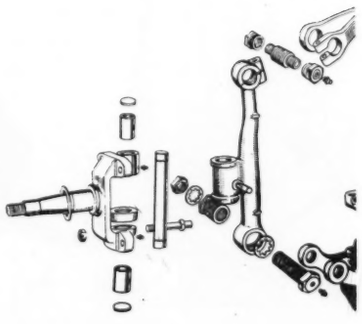
### Front Axle

Independent suspension, coil spring type. Caster, minus ¼ to minus 1 deg. Camber, ⅛ to 1 deg. King pin inclination, 4 deg. 51 min. Toe-in, 1/16 in. Eccentric pin in upper control arm controls caster and camber. To adjust, loosen steering knuckle support clamp screw, remove the lubrication fitting from front bushing of eccentric pin and insert Allen set screw wrench to turn pin as required. Turning pin clockwise increases caster. One-half turn of pin changes camber to maximum high and low limits. One complete turn of pin changes caster 1 deg. and leaves camber constant. Toe-in. is adjusted by turning each tie rod after wheels have been placed in straight-ahead position. Tread 58⅜ in.




CONNECTING ROD BEARING CAP



# Studebaker

President

### Engine

Eight cylinder, 3 1/16 x 4¼ in. Standard compression ratio 6.5 to 1. Approximate compression pressure 112 lb. Firing order 1-6-2-5-8-3-7-4.

### Carburetor

Stromberg EE-1, 1 in. dual unit. Low speed idling adjustment controls fuel. Turn out for richer mixture. Fuel level should be 15/32 in. below gasket face of the float bowl with the engine not running. Automatic choke adjustment—The rod which connects the choke unit with the carburetor choke valve should measure 9 5/16 in. between centers of the holes in the choke and carburetor choke valve levers.

### Distributor

Delco Remy 662-M. Full automatic advance with 27 deg. centrifugal advance and 12 deg. vacuum advance. Breaker points should be set to .020 in.

### Ignition Timing

With breaker points clean and adjusted to .020 in., the stationary points should open when the UDC 1-8 mark on the flywheel is directly under the pointer on the clutch housing. The movable points should open 90 crankshaft deg. or 33 1/3 flywheel teeth later. It is not necessary to lock the spark modifier with a pin as was customary with some previous models.

### Spark Plugs

Standard equipment, Champion No. 8-A. Correct gap .025 in. For hard fast driving use Champion No. 7-A.

### Valves

For operating, set valve tappets at .016 in. clearance with the engine cold. Valve seat angle 45 deg.

### Valve Timing

With valve tappets set to .020 in. clearance, intake valve should open 15 deg. or 5½ flywheel teeth before top center and the exhaust should close 10 deg. or 3 flywheel teeth after top center.

### Pistons

Aluminum alloy, cam ground. A pull of 7 to 13 lb. should be required to withdraw a .003 in. feeler 1 in. wide, inserted between the cylinder wall and the piston on the camshaft side of the engine with the piston slot on the opposite side of the engine. Pistons are removed through the top of the engine.

### Connecting Rods

Rod and piston assemblies are removed through the top of the block. Rod bearings are of the removable steel backed, lead bronze bearings. Rod bearing clearance should be .0005 to .002 in.

### Main Bearings

These are of the steel babbitt lined interchangeable type.

### Battery

Standard equipment 105 amp. hr. 15 plate Willard. Positive terminal grounded.

### Generator

Maximum charging rate, hot, 26 amp. at 7.5 volts at 2000 r.p.m.

To check voltage regulator—disconnect the IGN and BAT leads from generator. Connect IGN and BAT terminals. Connect one end of fixed resistance to BAT and the other end to engine. Connect Voltmeter to IGN and GRD terminals. Increased engine speed so generator turns at 2500 r.p.m. and not voltage at which regulator works. Unit should operate at 7.55-7.85 volts at 70 deg. and 7.4-7.6 at 150 deg. F. To check current regulator—Remove jumper lead and resistance unit and with the IGN lead disconnected from generator, connect one ammeter terminal to BAT and the other ammeter lead to the disconnected battery lead. Turn on lights and gradually increase generator speed until output is constant. The output should then be the amount for which the regulator is adjusted, or 24 to 26 amp.

### Starter

Delco Remy 729-G. Normal cranking speed 110 r.p.m. Lock torque 15 ft. lb. at 3.2 volts, and 575 amp. Running free—60 amp. at 1625 r.p.m.

### Wheel Alignment

Caster ¼ to ¾ deg. nonadjustable. Camber 1 to 1½ deg. adjustable by turning eccentric end of steering knuckle support arm. Toe-in ⅛ to 7/32 in. All measurements made with the car unloaded.

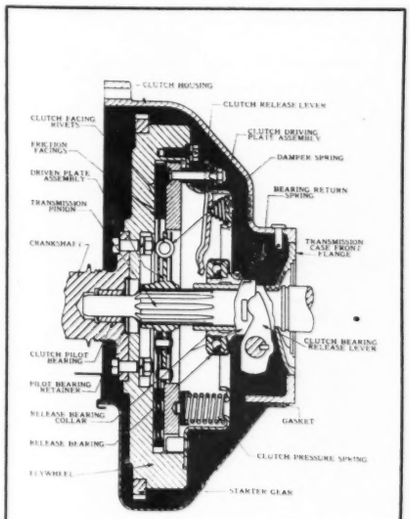
After serial number South Bend 7111836 and Studebaker Pacific 5803288 camer should be ½ deg. and king pin inclination 5½ deg.

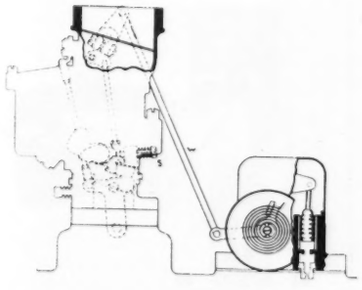
### Hill Holder

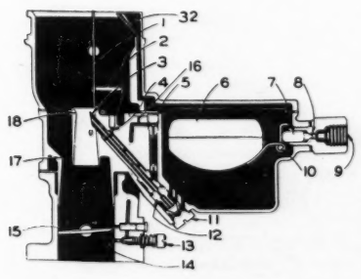
Make sure that the bosses on top of the unit are level when the car is level as indicated by a spirit level. Also adjust rod which links the clutch pedal with the hill holder operating lever so that the brakes release just ahead of clutch engagement. Adjust by increasing or decreasing length of rod as needed.

### Oil Pump

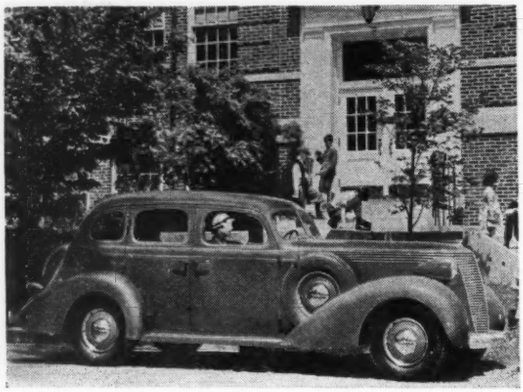
To insure correct spark timing, replace oil pump as follows: With No. 1, piston on the compression stroke, turn the engine until the UDC No. 1 & 6 mark on the flywheel comes under the pointer on the clutch housing. Oil pump assembly should then be placed so as to align the shaft with the coupling groove parallel with the camshaft and the wide side of the coupling toward the camshaft. This can be accomplished by rotating pump shaft about two pump teeth in clockwise direction (as viewed from below) from the above aligned positioin before pushing the assembly up into place.





# Studebaker



## Dictator

### Engine

Six cylinder, 3¼ x 4⅜ in. Firing order 1-5-3-6-2-4. Standard compression ratio 6.0 to 1. Approximate compression pressure 100 lb.

### Carburetor

Stromberg EX23, 1¼ in. Low speed idling adjustment controls fuel. Turn out for richer mixture. Accelerating pump—place in long stroke hole for cold weather driving. Fuel level should be ⅝ in. below gasket face of the float bowl with the engine not running. Automatic choke adjustment—Adjust rod "W" to 8 5/16 in. as measured from center to center of the holes in the choke and choke valve levers. Loosen pinch bolt on inner choke valve shaft lever, hold choke valve closed and position thermostat lever "U" so that there is 1/32 in. clearance between it and stop pin "T." Tighten pinch bolt. Next remove screw from the top of the vacuum chamber and push the piston to the bottom. Push lightly against the short side of the choke valve to eliminate linkage play. It should then be possible to insert a 29/64 in. drill between long side of choke and carburetor body. If not it is necessary to adjust rod "S."

### Distributor

Auto Lite IGW-4001. Full automatic type with 10½ deg. (on distributor) advance, and 6 deg. vacuum advance. Breaker points should be set to .018 to .024 in.

### Ignition Timing

With points cleaned and set to .018 in. breaker points should open when "IGN" mark on vibration damper lines up with the pointer on the timing gear cover. To eliminate possibility of bind in the spark modifier hook-up a .016 in. feeler should be placed between the modifier and the distributor control arms before tightening the clamp screw.

### Spark Plugs

Standard equipment Champion type 8-A. Correct gap .025 in.

### Valves

For operating set valve tappets to .016 in. clearance with the engine cold. Valve seat angle 45 deg.

### Valve Timing

After setting valve tappets to .020 in. clearance, intake valve should open 15 deg. or 5½ flywheel teeth before top center and the exhaust should close 10 deg. or 3 flywheel teeth after top center.

### Pistons

Aluminum alloy cam ground. A pull of 7 to 15 lb. should be required to withdraw a .002 in. feeler, 1 in. wide, inserted between the piston and the cylinder wall on camshaft side of engine with the piston slot on the opposite side of the engine. Pistons are removed through the top of the engine.

### Connecting Rods

Rod and piston assemblies are removed through the top of the block. Rod bearings are of the integral, spun babbitt type. Rod bearing clearance should be .0005 in. to .002 in.

### Main Bearings

These are of the steel backed babbitt lined interchangeable type.

### Battery

Standard equipment 105 amp. hr. 15 plate, Willard. Positive terminal grounded.

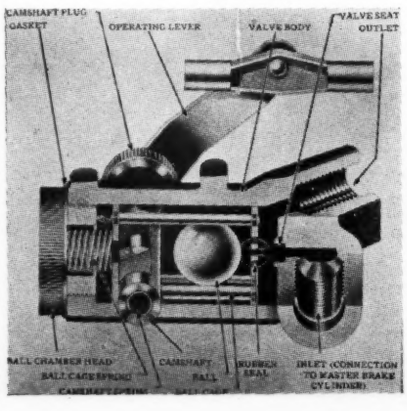
### Generator

Auto Lite model GBM-4607-A2, Third brush type. Maximum charging rate hot, 17 amp. at 8.5 volts and 2000 r.p.m.

A high output generator with voltage control unit is also available as special equipment. Maximum output cold is 25 amp. hot 22 amp.

### Starter

Auto Lite Model MAX-4028. Cranking speed 110 r.p.m. Lock torque test 640 amp., 3.2 volts and 16 ft. lb. No load test 60 amp. 5.6 volts and 5000 r.p.m. Drive through over running clutch.

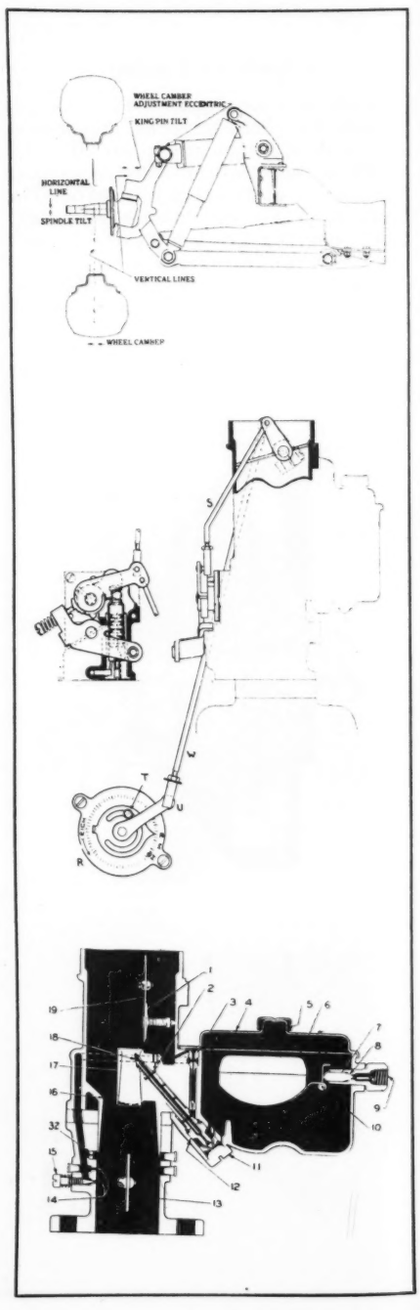



### Steering

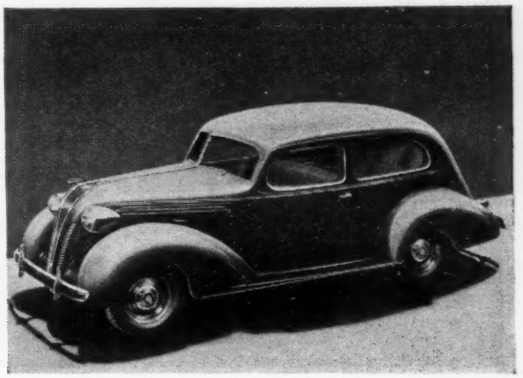
On models with conventional front axle—Camber 1 to 1½ deg., caster 1 to 1½ deg., toe-in 1/16 to ⅛ in. King pin tilt 9½ deg. spring pad angle 1½ deg. On models with planer type front end suspension—caster ¼ to ¾ deg. non-adjustable. Camber 1 to 1½ deg. adjustable by turning eccentric at the outer end of the steering knuckle support arm. Toe-in ⅛ to 7/32 in. All measurements to be made with the car unloaded.

### Hill Holder

Make sure that the bosses on top of the unit are level when the car is level. Check with spirit level. Also adjust rod which links the clutch pedal with the hill holder operating lever so that the brakes release just ahead of clutch engagement. Adjust by increasing or decreasing length of rod as needed.



# Terraplane

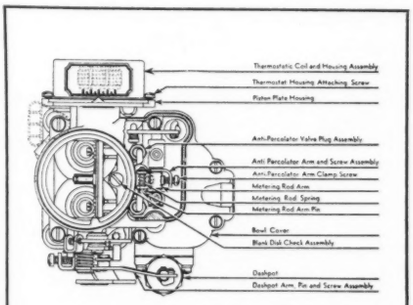


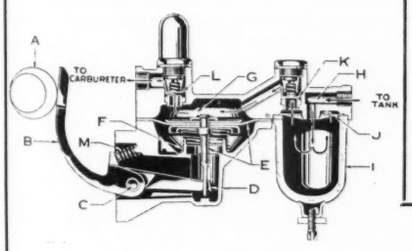
### Engine

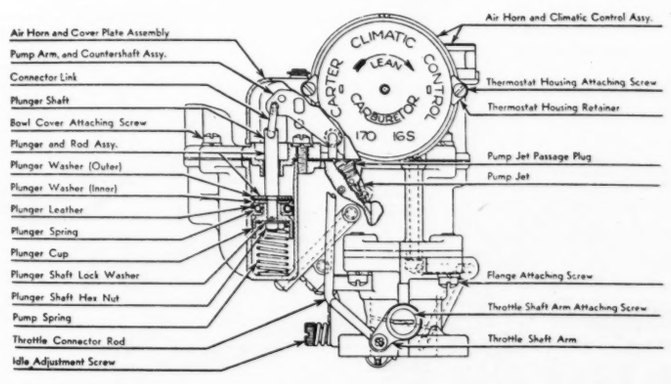
Starting engine No. 250,000. Six cylinder 3 x 5 in. Firing order 1-5-3-6-2-4. Compression ratios 6.25 to 1, and 7.00 to 1. Compression pressures approximately 105 lb. and 120 lb.

### Carburetor

Carter carburetor Model 344 S. Pump adjustment: With pump adjustment link in short stroke (lower hole) adjust throttle connector rod by bending it to give 15/64 in. pump stroke. Travel can be checked by marking shaft at casting at wide open position and fully closed position and gaging distance between marks. After adjusting pump stroke, replace connector rod springs and replace spring retainers. Metering rod adjustment should be made when reassembling carburetor or when new metering rods are installed. Carter gage No. T109-27 should be used. Anti-percolator adjustment should be checked after metering rod setting. Back out throttle lever adjusting screw and do not disturb metering rod setting. With throttle valves tightly closed, insert .015 in. feeler gage between anti-percolator stem and lip on anti-percolator arm, and adjust lips on anti-percolator arm to depress anti-percolator stem so indicator line is flush with top on anti-percolator plug. Be sure even adjustment is made on both lips. Install air horn assembly, dash pot arm, pin and screw assembly. Then, install dash pot connector link and pin spring. Adjustment for unloader: With throttle wide open, distance between upper edge of choke valve and wall of air horn should be ¼ in. Adjustment can be made by bending lip on fast idle connector link. If unloader is adjusted properly, with throttle wide open, move choker valve wide open and choker valve will be locked in wide open position. Closing throttle will release choker valve. Fast idle adjustment: Hold choker valve tightly closed and adjust fast idle arm screw to give .018 in. opening between edge of throttle valve and bore of carburetor side opposite port. Use Carter gage No. 15596.




### Distributor

Auto Lite model IGW-4012A. Single breaker type full automatic advance. Breaker point gap .020 in. Breaker spring tension 16 to 20 oz. Minimum advance 3, 7, 10, 13, 16, 19, 22, 25, 27, 27 at 400, 560, 720, 880, 1040, 1200, 1360, 1520, 1630, 2000 r.p.m. respectively.

### Ignition Timing

Clean and adjust breaker points to .020 in. Set ignition points to open when "DC" mark on flywheel lines up with pointer. Timing inspection hole is left side on the front face of the engine rear support plate.

### Spark Plugs

Standard equipment Champion J-8. Set gap to .022 in.

### Valves

Operating tappet clearance should be set with the engine warm, intake .006 in., exhaust .008 in.

### Valve Timing

Intake valve opens 10 2/3 deg. or 4 flywheel teeth before top center and exhaust valve closes 18 2/3 deg. or 6¾ flywheel teeth after top center. When installing new timing gears, mesh punch marked tooth of the crankshaft gear between the two punch marks on the camshaft gear.

### Connecting Rods

Rod and piston assemblies are withdrawn through the top of the block. Bearings are adjustable by means of shims.

### Main Bearings

Puller required to remove front and rear main bearings as sufficient force is required to shear the packing in the groove. After replacing the bearing caps and cleaning the grooves, drive cotton wicking into the front bearing cap horizontal hole first. Then drive wicking into vertical holes of both front and rear bearing caps.

### Generator

Auto Lite GCJ-4803-A. Maximum charging rate, hot, 21.7 amp. at 8 volts and 2700 r.p.m. To check voltage regulator, connect ammeter between terminal marked "B" and lead disconnected from that terminal. Also connect voltmeter across regulator "B" terminal and terminal marked "GD." Battery must be fully charged. Then with engine running at 30 m.p.h. and the generator warm, ammeter should read below the maximum to which it was set and the voltmeter should read 7.4 to 7.9 volts.

### Starter

Auto Lite MAB 4075. On no load test, should draw 60 amp. at 5.5 volts at 2250 r.p.m. Lock torque test—780 amp. at 4.0 volts, 22.5 ft. lb.

### Clutch

To drain clutch, crank engine until one of the plugs in the front of the flywheel is in the inspection hole opening at the left side of the engine rear support plate. Remove engine and crank engine until star on flywheel is in line with the timing pointer. After draining, again crank engine until plug hole lines up with inspection opening and refill clutch with proper lubricant.

### Steering

Caster 1 to 2 deg. Camber 1½ deg. Toe-in zero to ⅛ in. King pin inclination 7 deg.

# Willys

**Model 37**

### Engine

Four cylinder 3⅛ x 4⅜ in. Firing order 1-3-4-2. Compression ratio 5.7 to 1. Approximate compression pressure 87 lb. at 216 r.p.m.

### Carburetor

Tillitson model U-1-A. 1⅛ in. single downdraft. To adjust: Before starting engine, close main adjustment V by turning clockwise to its seat. Then open three complete turns. Close idle adjustment J by turning clockwise, then open ¾ turn. Then start engine and when warm adjust main adjustment V clockwise until engine misses and then turn out until engine reaches maximum speed for that throttle setting. Then turn in or clockwise approximately ⅜ turn. Then increase idling speed slightly by means of screw P. Then turn adjustment J counter clockwise until engine misses, then clockwise until engine runs evenly. Then readjust idling speed at P. To set float level—remove air horn casting, then carefully bend float lever so fuel level is ¾ in. below rim of float bowl.

### Distributor

Auto Lite model IGS-4007. Single breaker arm unit with 25 deg. centrifugal advance and 23 deg. vacuum advance. Breaker gap .018 in.

### Ignition Timing

Clean breaker points and set gap to .018 in. Breaker points should just be opening for No. 1 cylinder when IGN mark on flywheel lines up with pointed end of inspection plate screw. Or, breaker points open 5 deg. after top center or .0103 in. of piston travel after top center. To advance timing turn distributor body in clockwise direction.

### Spark Plugs

Eighteen millimeter. Correct gap .025 in.

### Valves

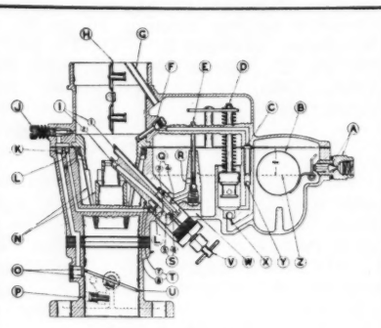
Valve tappet clearance for operating intake .004 in., exhaust .006 in. Valve seat angle 45 deg. Valve stem diameter .371 in. Valve springs—intake and exhaust 85½ lb. 1 15/16 in., and 46½ lb. at 2¼ in.

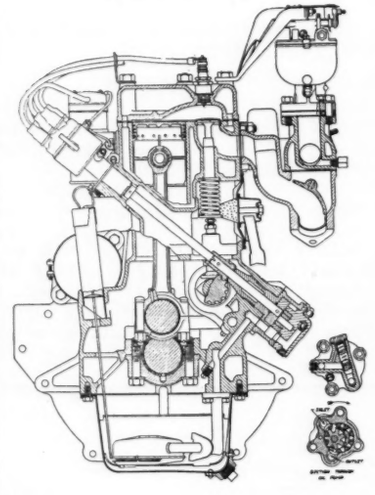
### Valve Timing

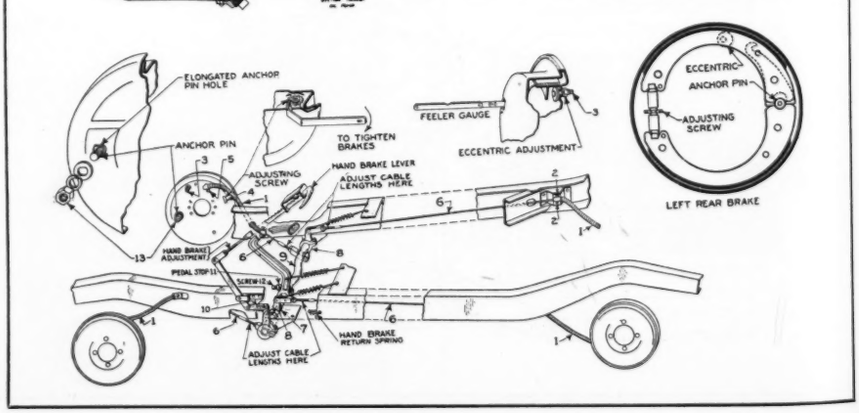
With valve tappets set to .010 in. with the engine cold, intake valve opens at top center (flywheel marked "IO"). Exhaust valve closes 5 deg. after top center, or when IGN mark on flywheel lines up with inspection plate screw or when the piston has moved .0103 in. after top center. When installing timing chain, punch marks on camshaft and crankshaft sprockets should be brought together and in line with the centers of the shafts.

### Pistons

Light weight cast iron. Clearance at top land .015 in. Clearance at skirt .0027 in. Piston and rod assemblies are removed through the top of the block.








### Connecting Rods

Rod bearings are of the spun in babbitt type, 1 15/16 in. diameter and 1 15/16 in. long. Clearance .0015 in. Rod and piston assemblies are removed through the top of the block. Rods are installed with the squirt hole on the side opposite the camshaft.

### Main Bearings

Steel backed babbitt, interchangeable type. Clearance .0015 in. Diameter 2.334 in. Length of front and center bearing 2.00 in.

### Battery

Standard equipment 95 amp. hr., 13 plate USL. Negative terminal grounded.

### Generator

Auto Lite GAM-4504. Maximum charging rate cold 17 amp. at 8 volts and 2400 r.p.m. Maximum charging rate hot 12.5 amp. at 8 volts and 2350 r.p.m. Charging rate increased by moving third brush in the direction of armature rotation.

### Starter

Auto Lite MZ-4049. Cranking speed 216 r.p.m. Lock torque 12¼ ft. lb. and 540 amp. at 4.0 volts. Running free 70 amp. at 5.5 volts and 4300 r.p.m.

### Clutch

Borg and Beck type. Clearance of 1/16 in. must be maintained between release levers and release bearings. To obtain this clearance clutch pedal should be against the under side of the toe board, then adjust the length of the clutch control cable so that the pedal has ¾ to 1 in. free movement. When rebuilding clutch, make sure that three release levers contact the release bearing at the same time and that the distance from front face of release bearing to rear face of clutch backing plate is 1 3/16 in. This adjustment is accomplished by means of the knurled screw in each of the release levers.

### Wheel Alignment

Caster 3 deg., camber 2 deg., toe-in 3/16 in. King pin inclination 7½ deg.

# 20 Questions

## . . . AND ANSWERS THAT SHOULD INTEREST EVERY DEALER WHO IS LOOKING FOR A NEW AND MORE PROFITABLE FRANCHISE

**1.** ***What assurance of permanence does your franchise carry?***
Pontiac offers you the franchise of one of the fastest-growing divisions of General Motors, world's largest automotive organization!

**2.** ***What is your company's record of growth for the past three years?***
Pontiac's output has nearly tripled over that period, and many Pontiac dealers have increased sales even more than that!

**3.** ***Does your franchise give you sliding scale discount?***
Pontiac's discount on parts and accessories ranks with the highest in the industry, and on car sales dealers benefit by sliding scale discounts which increase as more cars are sold, up to a reasonable number of sales!

**4.** ***In what price field does your present franchise place you?***
Pontiac puts you in the low-price field with a quality six costing just a few cents a day more than the next lower-priced cars, and the lowest-priced eight in the General Motors line!

**5.** ***What is the volume potential of your market?***
The Pontiac line is priced to compete successfully in the price field in which 90 per cent of all cars are sold!

**6.** ***Does your franchise give you a protected territory?***
The Pontiac franchise provides exclusive selling rights to dealers within certain well-defined areas, and this provision is enforced to the limit.

**7.** ***Does your franchise protect you against list price reductions of current models?***
Pontiac protects dealers against such reductions on all new and unused current models in stock at the time of the reduction!

**8.** ***Does your franchise protect you on model changes?***
Pontiac protects the dealer on any new and unused current model cars in stock in excess of 3 per cent of his current model purchases.

**9.** ***Are you allowed to estimate in advance the number and models of cars you want?***
Pontiac's yearly production is based on dealers' forecasts, and day-to-day production of various body types is based on dealers' orders.

**10.** ***Does your company have nearby zone warehouses to speed delivery on orders for models not in stock?***
Pontiac's system of conveniently located warehouses helps dealers to meet customers' exact requirements in the shortest possible time.

**11.** ***Does your franchise give you adequate parts service?***
Thirty-six warehouses give all Pontiac dealers convenient sources of supply and enable them to buy parts for other General Motors cars at dealer net discounts.

**12.** ***What financing assistance do you have?***
Pontiac dealers have available the services of the world's largest finance company, providing retail and wholesale financing and low-cost insurance.

**13.** ***Does your company ask your advice on matters of merchandising?***
Pontiac holds regular dealer and factory meetings to analyze problems and exchange ideas.

**14.** ***Does your franchise give you the advantages of a service training school?***
Pontiac provides continuous mechanical training to show dealers' service departments the most efficient way to service Pontiac cars.

**15.** ***Will your company help you to improve your profit position?***
Pontiac makes available to dealers, without charge, practical and comprehensive business management assistance.

**16.** ***Are you and your owners protected by an owner service policy?***
The Pontiac Owner Service Policy protects dealers during the warranty service period by liberal provisions for replacements and labor charges!

**17.** ***Are your company's products backed by adequate research facilities?***
Pontiac can draw on the facilities of the largest industrial research and testing laboratories in the industry.

**18.** ***Do you get an adequate amount of forceful local advertising?***
Pontiac dealers get local newspaper and outdoor advertising in direct proportion to their sales, in addition to extensive and continuous national advertising.

**19.** ***Do you get practical sales promotion help?***
Pontiac sales promotion covers all phases of merchandising and has won high dealer praise for its effectiveness.

**20.** ***Does your present franchise contain all these advantages?***
To the best of Pontiac's knowledge, no other franchise contains all these liberal provisions. If yours does not measure up, you will do well to write for the complete Pontiac story.

*"Everything points to the Pontiac Franchise*
**AS THE BEST BET OF THE YEAR"**

If you are interested in the Pontiac franchise, write personally to C. P. Simpson, General Sales Manager, Pontiac Motor Division, General Motors Sales Corporation, Pontiac, Michigan, and your inquiry will be treated as confidential.

# Mechanical Specifications

*These Specifications Are Brought Up-to-Date Each Month by the Car Manufacturers and Supersede All Others Previously Published.*

| Line Number | MAKE AND MODEL | Lowest Priced 4-door Sedan | Wheelbase (Ins.) | Tire Size (Ins.) | ENGINE | | | | | | | | | | | | | | | CHASSIS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. of Cylinders, Bore and Stroke | Taxable HP. | Piston Displacement (Cu. Ins.) | Maximum Brake HP. at Specified R.P.M. | Compression Ratio (to—1.) | Displacement Factor δ | Cylinder Head Material | Camshaft Drive Make | Piston Material | Oil Cleaner Make | Air Cleaner Make | Carburetor Make | Muffler Make | Electrical System Make | Battery Make | Clutch Type and Make | Gearset Make | Universals Type and Make | Rear Axle Type and Make | Rear Axle Ratio | Front Spring Suspension |
| 1 | Buick | 37-40 | 976 | 122 | 6.50/16 | 8-3 3/16x4 1/2 | 30.6 | 248.0 | 100-3200 | 5.70 | 39.2 | CI | LB | Ala | No | AC | SM | Wal | D | Del | P.Own | Own | m-Spi | ½ Own | 4.40 | IC |
| 2 | Buick | 37-60 | 1162 | 126 | 7.00/15 | 8-3 1/16x4 1/8 | 37.8 | 320.2 | 130-3400 | 5.75 | 42.7 | CI | LB | Ala | No | AC | SM | Wal | D | Del | P.Own | Own | m-Spi | ½ Own | 3.90 | IC |
| 3 | Buick | 37-80 | 1418 | 131 | 7.00/16 | 8-3 1/16x4 1/8 | 37.8 | 320.2 | 130-3400 | 5.75 | 39.4 | CI | LB | Ala | No | AC | SM | Wal | D | Del | P.Own | Own | m-Spi | ½ Own | 4.22 | IC |
| 4 | Buick | 37-90 | 1966 | 138 | 7.50/16 | 8-3 1/16x4 1/8 | 37.8 | 320.2 | 130-3400 | 5.75 | 40.2 | CI | LB | Ala | No | AC | SM | Wal | D | Del | P.Own | Own | m-Spi | ½ Own | 4.62 | IC |
| 5 | Cadillac | V8-60 & 65 | (f) | 124, 131 | (t) | 8-3 1/16x4 1/2 | 39.2 | 346.0 | 135-3400 | 6.25 | 40.9 | CI | Mor | Ala | Han | AC | Str | Old | D | Del | P.Long | Own | Nb-Mec | ½ Own | (w) | IC |
| 6 | Cadillac | V8-70 & 75 | (h) | 131-38 | 7.50/16 | 8-3 1/16x4 1/2 | 39.2 | 346.0 | 135-3400 | 6.25 | 41.4 | CI | Mor | Ala | Han | AC | Str | Old | D | Del | P.Long | Own | Nb-Mec | ½ Own | (v) | IC |
| 7 | Cadillac | V12-85 | 3535 | 138 | 7.50/16 | 12-3 1/16x4 | 46.9 | 368.0 | 150-3600 | 6.00 | 40.8 | CI | Mor | Ala | Han | AC | DL | Own | D | Del | P.Long | Own | Nb-Mec | ½ Own | 4.60 | IC |
| 8 | Cadillac | V16-90 | 7545 | 154 | 7.50/17 | 16-3x4 | 57.6 | 452.0 | 185-3800 | 6.00 | 40.5 | CI | Mor | Ala | Han | AC | DL | Own | D | D | dp.Own | Own | Nb-Mec | ¾ Own | 4.64 | IC |
| 9 | Chevrolet | Master | 667 | 112¼ | 6.00/16 | 6-3 1/16x3 3/4 | 29.4 | 216.5 | 85-3200 | 6.25 | 35.4 | CI | Own | CI | No | AC | Car | Own | D | D | P.Own | Own | m-Own | ½ Own | 3.73 | C |
| 10 | Chevrolet | Mas.DeL. | 739 | 112¼ | 6.00/16 | 6-3 1/16x3 3/4 | 29.4 | 216.5 | 85-3200 | 6.25 | 39.0 | CI | Own | CI | No | AC | Car | Own | D | D | P.Own | Own | m-Own | ½ Own | 4.22 | IC |
| 11 | Chrysler | Roy. C-16 | 910 | 116 | 6.25/16 | 6-3 5/16x4 1/4 | 27.3 | 228.1 | 93-3600 | 6.50 | 38.8 | CI° | Mor | Ala | Pur | Bur | Car | NS | A | Wil | P.B&B | Own | Nb-UP | ½ Own | 4.10 | IC |
| 12 | Chrysler | Imp. C-14 | 1100 | 121 | 6.50/16 | 8-3 1/4x4 1/8 | 33.8 | 273.8 | 110-3600 | 6.70 | 41.7 | Al | Mor | Ala | Pur | AC | Str | NS | A | Wil | P.B&B | Own | Nb-UP | ½ Own | 4.10 | IC |
| 13 | Chrysler.Cus.Im.C-15 | | 2060 | 140 | 7.50/16 | 8-3 1/4x4 7/8 | 33.8 | 323.5 | 130-3400 | 6.50 | .... | Al | Mor | Ala | Pur | AC | Str | NS | A | Wil | P.B&B | Ot | Nb-UP | ½ Own | 4.55 | IC |
| 14 | Chrysler.Airflow C-17 | | 1610 | 128 | 7.50/16 | 8-3 1/4x4 7/8 | 33.8 | 323.5 | 130-3400 | 6.50 | 40.3 | Al | Mor | Ala | Pur | AC | Str | Bur | A | Wil | P.B&B | Ot | Nb-UP | ½ Own | 4.30 | C |
| 15 | Cord | 812 | 2445 | 125 | 6.50/16 | 8-3 1/16x3 3/4 | 39.2 | 288.6 | 115-3600 | 6.30 | 40.3 | Al | Whit | Al | No | AC | Str | NS | A | USL | P.Long | Own | Ben | Tu Own | 4.70 | IT |
| 16 | De Soto | S-3 | 870 | 116 | 6.00/16 | 6-3 5/16x4 1/4 | 27.3 | 223.1 | 93-3600 | 6.50 | 39.0 | CI° | Mor | Ala | Pur | Bur | Car | NS | A | Wil | P.B&B | ..... | Nb-UP | ½ Own | 4.10 | IC |
| 17 | Dodge | Six | 820 | 115 | 6.00/16 | 6-3 1/4x4 3/8 | 25.3 | 217.8 | 87-3600 | 6.50 | 38.7 | CI | Mor | Als | Pur | AC | Str | NS | A | Wil | P.B&B | ..... | Nb-UP | ½ Own | 4.10 | C |
| 18 | Duesenberg | J | ..... | 142-153½ | 7.00/19° | 8-3 3/4x4 3/4 | 45.0 | 419.7 | 320-4200 | 5.20 | .... | CI | LB | Al | Pur | Yes | Str | ..... | D | Exi | dpLong | Own | m-Spi | ½ Own | .... | C |
| 19 | Ford | V8-60 | 604‡ | 112 | 5 50/16 | 8-2.6x3.2 | 21.6 | 136.0 | 60-4200 | 6.6 | 30.4 | Al | Gear | CS | No | Yes | Str | Own | O | Own | P | Own | m-Spi | ¾ Own | 4.44 | Tr |
| 20 | Ford | V8-85 | 645‡ | 112 | 6.00/16 | 8-3 1/8x3 3/4 | 30.0 | 221.0 | 85-3800 | 6.12 | 37.9 | Al | Gear | CS | No | Yes | Str | Own | O | Own | P.Os | Own | m-Spi | ¾ Own | 3.78 | Tr |
| 21 | Graham | 85 | 770 | 111 | 5.25/17 | 6-3x4 | 21.6 | 169.6 | 70-3500 | 6.80 | 35.7 | Al | LB | Als | No | Bur | Mar | Old | D | Wil | P.Ill | WG | Nb-UP | ½ Spi | 4.55 | C |
| 22 | Graham | 95 | 905 | 116 | 6.00/16 | 6-3 1/4x4 | 25.3 | 199.1 | 85-3800 | 6.70 | 37.9 | Al | LB | Als | No | Bur | Mar | Old | D | Wil | P.Long | WG | Nb-UP | ½ Spi | 4.45 | C |
| 23 | Graham | S.C. 116 | 1050 | 116 | 6.25/16 | 6-3 1/4x4 | 25.3 | 199.1 | 106-4000 | 6.70 | .... | Al | LB | Als | Fram | Bur | Mar | Old | D | Wil | P.Long | WG | Nb-UP | ½ Spi | 4.27 | C |
| 24 | Graham | S.C. 120 | 1160 | 116-120 | 6.50/16 | 6-3 1/4x4 3/8 | 25.3 | 217.8 | 116-4000 | 6.70 | .... | Al | LB | Als | Fram | Bur | Mar | Old | D | Wil | P.Long | WG | Nb-UP | ½ Spi | 4.27 | C |
| 25 | Hudson | 6-73 | 935 | 122 | 6.00/16 | 6-3x5 | 21.6 | 212.0 | 101-4000 | 6.25 | 36.8 | CI° | Ge° | Al | No | AC | Car | Old | A | Nat | P.Own† | Own | Nb-Spi | ½ Own | 4.11 | C |
| 26 | Hudson | 8, 74-5-6-7 | 995 | 122, 129 | 6.25/16 | 8-3x4½ | 28.8 | 254.0 | 122-4200 | 6.25 | 41.2 | CI° | Ge° | Al | No | AC | Car | Old | A | Nat | P.Own† | Own | Nb-Spi | ½ Own | 4.11 | C |
| 27 | La Salle | V8, 37-50 | 1260 | 124 | 7.00/16 | 8-3 5/16x4 1/2 | 36.4 | 322.0 | 125-3400 | 6.25 | 41.0 | CI | Mor | Ala | Han | AC | Str | Old | D | Del | P.Long | Own | Nb-Mec | ½ Own | 3.92 | IC |
| 28 | Lincoln | V12 | ..... | 136-145 | 7.50/17 | 12-3 1/16x4 1/2 | 46.8 | 414.0 | 150-3400 | 6.38 | 38.9 | Al | Ch | Ala | Pur | Yes | Str | Own | A | Exi | P.Long | Own | m-Spi | FF Tim | 4.58 | C |
| 29 | Lincoln-Zephyr | | 1296 | 122 | 7.00/16 | 12-2 3/4x3 3/4 | 36.3 | 267.3 | 110-3900 | 6.7 | 42.6 | Al | Gear | CS | No | Yes | Str | Own | O | Own | P.Os | Own | m-Own | ¾ Own | 4.44 | Tr |
| 30 | Nash | Amb. 6, 3720 | 960 | 121 | 6.25/16 | 6-3 5/16x4 3/8 | 27.3 | 234.8 | 93-3400 | 5.67 | 36.2 | CI | Whit | Als | BS | Bur | Str | Wal | A | USL | P.B&B | Ot | Nb-Mec | ½ Own | 4.11 | C |
| 31 | Nash | Amb. 8, 3780 | 1080 | 125 | 7.00/16 | 8-3 1/16x4 1/4 | 31.2 | 260.8 | 105-3400 | 5.64 | 35.5 | CI | Dia | Als | BS | AC | Str | Wal | A | USL | P.B&B | Ot | Nb-Mec | ½ Own | 4.10 | C |
| 32 | Nash Lafay | 400-3710 | 810 | 117 | 6.00/16 | 6-3 5/16x4 3/8 | 27.3 | 234.8 | 90-3400 | 5.61 | 37.4 | CI | Whit | Als | ..... | Bur | Str | Wal | A | USL | P.B&B | Ot | Nb-Mec | ½ Own | 4.11 | C |
| 33 | Oldsmobile | F37 | 875 | 117 | 6.50/16 | 6-3 1/16x4 1/16 | 28.4 | 229.7 | 95-3400 | 6.10 | 38.1 | CI | Whit | Ala | No | AC | Car | Var | D | D | P.B&B | Own | Nb-Mec | ½ Own | 4.37 | IC |
| 34 | Oldsmobile | L37 | 990 | 124 | 7.00/16 | 8-3 1/4x3 7/8 | 33.8 | 257.1 | 110-3600 | 6.20 | 39.1 | CI | LB | Ala | No | AC | Car | Var | D | D | P.B&B | Own | Nb-Mec | ½ Own | 4.37 | IC |
| 35 | Packard | 115C | 995 | 115 | 6.50/16 | 6-3 1/16x4 1/4 | 28.3 | 237.0 | 100-3600 | 6.30 | 39.7 | CI | Mor | Als | No | AC | CG | Old | D | Wil | P | Own | Nb-Mec | ½ Own | 4.36 | IC |
| 36 | Packard | 120C | 1170 | 120 | 7.00/16 | 8-3 1/4x4 1/4 | 33.8 | 282.0 | 120-3800 | 6.50 | 40.7 | Al | Mor | Als | No | AC | SC | Old | A | PD | P | Own | Nb-Mec | ½ Own | 4.09 | IC |
| 37 | Packard | 1500, 1, 2 | 2480 | 127-34-39 | 7.50/16 | 8-3 1/16x5 | 32.5 | 320.0 | 130-3200 | 6.50 | 41.0 | Al | Mor | Als | Pur | AC | Str | Old | DA | PD | P | Own | Nb-UP | ½ Own | 4.69 | IC |
| 38 | Packard | 1506, 7, 8 | 3670 | 132-39-44 | 8.25/16 | 12-3 1/16x4 1/4 | 56.7 | 473.0 | 175-3200 | 6.40 | 46.8 | Al | Mor | Als | Pur | AC | Str | Old | DA | PD | P | Own | Nb-Spi | ½ Own | 4.41 | IC |
| 39 | Pierce-Arrow | 1701 | 3375 | 138-144 | 7.00/17 | 8-3 1/16x5 | 39.2 | 385.0 | 150-3400 | 6.40 | 37.6 | Al | Whit | Als | Pur | AC | Str | Buf | D‡ | Wil | P.Long | WG | Nb-UP | ½ Own | 4.58 | C |
| 40 | Pierce-Arrow | 1702 | 3895 | 138-144 | 7.50/17 | 12-3 1/2x4 | 58.8 | 462.0 | 185-3400 | 6.40 | 42.0 | Al | Whit | Als | Pur | AC | Str | Buf | D‡ | Wil | P.Long | WG | Nb-UP | ½ Own | 4.58 | C |
| 41 | Pierce-Arrow | 1703 | 5015 | 147 | 7.50/17 | 12-3 1/2x4 | 58.8 | 462.0 | 185-3400 | 6.40 | 40.7 | Al | Wh't | Als | Pur | AC | Str | Buf | D‡ | Wil | P.Long | WG | Nb-UP | ½ Own | 4.58 | C |
| 42 | Plymouth | P3 | 665 | 112 | 5.50/16 | 6-3 1/16x4 3/8 | 23.4 | 201.3 | 82-3600 | 6.70 | 36.7 | CI | Mor | Ala | No | BA | Car | NS | A | Wil | P.B&B | Own | Nb-UP | ½ Own | 3.90 | C |
| 43 | Plymouth | P4 | 745 | 112 | 6.00/16 | 6-3 1/16x4 3/8 | 23.4 | 201.3 | 82-3600 | 6.70 | 36.5 | CI | Mor | Ala | Pur | BA | Car | NS | A | Wil | P.B&B | Own | Nb-UP | ½ Own | 4.10 | C |
| 44 | PontiacDeL.6,37-26CA | | ₹36 | 117 | 6.00/16 | 6-3 1/16x4 | 28.3 | 222.7 | 85-3520 | 6.20 | 38.5 | CI | Mor | CHI | No | AC | Car | BO | D | Del | P.Own | Own | Nb-Mec | ½ Own | 4.37 | IC |
| 45 | Pontiac DeL.8,37-28A | | 894 | 122 | 6.50/16 | 8-3 1/4x3 3/4 | 33.8 | 248.9 | 99-2800 | 6.20 | 40.5 | CI | Mor | CHI | No | AC | Car | BO | D | Del | P.Own | Own | Nb-Mec | ½ Own | 4.37 | IC |
| 46 | Studebaker | Dict. 6 | 880 | 116 | 6.00/16 | 6-3 1/4x4 3/8 | 25.4 | 217.8 | 90-3400 | 6.00 | 40.2 | CI | Dia | Ly | Fram | AC | Str | Buf | A | Wil | P.B&B | WG | Ru-Th | ½ Spi | 4.55 | C |
| 47 | Studebaker | Dict. Pl. | 900 | 116 | 6.00/16 | 6-3 1/4x4 3/8 | 25.4 | 217.8 | 90-3400 | 6.00 | 40.2 | CI | Dia | Ly | Fram | AC | Str | Buf | A | Wil | P.B&B | WG | Ru-Th | ½ Spi | 4.55 | IT |
| 48 | Studebaker | Pres. | 1165 | 125 | 6.50/16 | 8-3 1/16x4 1/4 | 30.0 | 250.4 | 115-3600 | 6.50 | 39.9 | Al | Dia | Ly | Fram | Bur | Str | Bur | D | Wil | P.Long | WG | Nb-Spi | ½ Spi | 4.55 | IT |
| 49 | Terrap | DeL.&Sup.6 | (p) | 117 | 6.00/16 | 6-3x5 | 21.6 | 212.0 | 96-3900 | 6.25 | 38.3 | CI° | Ge | Al | No | AC | Car | Old | A | Nat | P.Own† | Own | Nb-Spi | ½ Own | 4.11 | C |
| 50 | Willys | 37 | 545 | 100 | 5.50/16 | 4-3 1/8x4 3/4 | 15.6 | 134.2 | 48-3200 | 5.70 | 32.2 | CI | LB | CI | No | AC | Til | Buf | A | USL | P.B&B | WG | m-UP | ½ Own | 4.30 | C |

**ABBREVIATIONS**
°—Others also †—Power Clutch
½—Semi-Floating
¾—Three Quarter Floating
‡—Does not include Federal Taxes
**Al**—Aluminum
**Ala**—Aluminum, Anode processed
**Als**—Aluminum Alloy with Strut
**C**—Conventional **Ch**—Chain
**CHI**—Chrome Nickel Iron
**CI**—Cast Iron
**CS**—Cast Steel **dp**—Double Plate
**FF**—Full Floating
**IC**—Independent, Coil
**IT**—Independent, Transverse
**Ly**—Lynite **m**—Metal
**Nb**—Needle Bearing
**P**—Single Plate **RU**—Rubber
**t**—60-7.00/16, 65-7.50/16
**Tr**—Transverse **Tu**—Tubular

**MAKES OF UNITS**
‡—Delco-Remy for Generator and Starter
**A**—Auto-Lite **BA**—Burgess or AC
**B & B**—Borg & Beck
**BO**—Buffalo or Oldberg
**BS**—Briggs & Stratton
**Buf**—Buffalo **Bur**—Burgess
**Car**—Carter
**CG**—Chandler-Groves
**Col**—Columbia **D**—Delco-Remy
**DA**—Delco-Remy Starter & Generator; Autolite Coil & Distributor
**Del**—Delco **Det**—Detroit
**Dia**—Diamond
**DL**—Detroit Lubricator
**Exi**—Exide
**Fram**—Fleming Mfg. Co.
**GE**—General Electric
**Han**—Handy **Ill**—Illinois
**LB**—Link-Belt **Mar**—Marvel
**Mec**—Mechanics **Mor**—Morse
**Nat**—National
**NS**—Noblitt Sparks
**O**—Own **Old**—Oldberg
**Os**—Own, semi-centrifugal
**PD**—Prest-O-Lite or Delco
**Pur**—Purolator
**SC**—Stromberg or Carter
**Spi**—Spicer **Str**—Stromberg
**Th**—Thompson Products
**Til**—Tillotson **Tim**—Timken
**UP**—Universal Products
**Var**—Various
**Wal**—Walker
**WG**—Warner Gear
**Whit**—Whitney
**Wil**—Willard

**(Specifications continued on page 68)**

# The pulling power of any sign depends on what's behind it

The name Exide means a dependable battery to millions of users—satisfied users.

Since the first electrically started and lighted automobile was equipped with an Exide—over a quarter of a century ago—Exide advertising—millions of dollars of it—has been telling the public over and over, of honest value and dependability.

Behind the product is a company moving along in the automotive world. Exide's modern merchandising plans, tools and equipment have put battery service on a new plane.

When the Exide sign goes up on your place of business, you become a part of the history and tradition of the greatest name in the battery business. You tie your name to a battery that produces profits. But more—you associate your entire business with the name of a product having the confidence and goodwill of the public. You have an identification that really means something.

Why not get in touch with your Exide Wholesaler now, or write to us?

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
*The World's Largest Manufacturers of Storage Batteries for Every Purpose*
Exide Batteries of Canada, Limited, Toronto

# Motor Car Price, Weight and Body Table

*Following are delivered prices at factory for cars with standard equipment and include all federal taxes with exception of Ford and Lincoln. Optional equipment, state or local taxes, transportation charges and finance charges are extra.*

| BODY, MAKE AND MODEL | Delivered Price | Shipping Weight |
|---|---|---|
| **BUICK** *—6 Wheel Equipment | | |
| Special 40 | | |
| Sedan, 2d | 914 | 3490 |
| Sed. Trunk, 2d | 940 | 3480 |
| Sedan, 4d | 950 | 3490 |
| Sed., Trunk, 4d | 976 | 3510 |
| Bus. Coupe, 2d | 868 | 3380 |
| Sport Coupe, 2d | 930 | 3445 |
| Conv. Coupe, 2d | 1011 | 3430 |
| Conv. Phae., 4d | 1257 | 3630 |
| Century 60 | | |
| Sedan, 2d | 1127 | 3720 |
| Sed., Trunk, 2d | 1152 | 3750 |
| Sedan, 4d | 1162 | 3750 |
| Sed., Trunk, 4d | 1188 | 3720 |
| Sport Coupe, 2d | 1142 | 3650 |
| Conv. Coupe, 2d | 1224 | 3715 |
| Conv. Phae. 4d | 1479 | 3840 |
| Roadmaster 80 | | |
| Phae., Trk., 4d* | 1755 | 4214 |
| Sed. Trunk, 4d | 1418 | 4159 |
| For. Sed., Tk., 4d | 1541 | 4229 |
| Limited 90* | | |
| Sed., Trunk, 4d | 2140 | 4549 |
| Lim. Trunk, 4d | 2242 | 4599 |
| Sed., Trunk, 4d | 1988 | 4489 |
| For. Sed., Tk., 4d | 2140 | 4409 |
| **CADILLAC** | | |
| V8 Series 60 | | |
| Sport Coupe | 1555 | 3710 |
| Tour. Sedan, 4d | 1660 | 3845 |
| Conv. Coupe, 2d | 1690 | 3745 |
| Conv. Sedan, 4d | 2020 | 3885 |
| V8-Series 65 | | |
| Tour. Sedan, 4d | 2090 | 4385 |
| V8-Series 70 | | |
| Sport Coupe | 2805 | 4285 |
| Tour. Sedan, 4d | 2595 | 4420 |
| Conv. Coupe, 2d | 2905 | 4325 |
| Conv. Sedan, 4d | 2960 | 4460 |
| V8-Series 75 | | |
| Tour. Sedan, 5p | 2815 | 4745 |
| Formal Sed., 5p | 3685 | 4745 |
| Town Sedan, 5p | 3325 | 4780 |
| Conv. Sedan, 5p | 3330 | 4980 |
| Tour. Sedan, 7p | 2970 | 4825 |
| Imp. Tr. Sed., 7p | 3170 | 4985 |
| Sp. Tr. Sedan 7p | 2310 | 4825 |
| Sp. I. T. Sed., 7p | 2810 | 4985 |
| Bus. Tr. Sed., 8p | 2745 | 4825 |
| Bus. I. Tr. Sed. 8p | 2950 | 4985 |
| Town Car, 7p | 4755 | 5055 |
| V12-Series 85 | | |
| Tour. Sedan, 4d | 3535 | 5050 |
| Tour. Sedan, 4d | 3590 | 5130 |
| Im. Tr. Sed., 4d | 3890 | 5165 |
| Town Sedan, 4d | 4045 | 5000 |
| Formal Sed., 4d | 4400 | 5050 |
| Conv. Sedan, 4d | 4350 | 5165 |
| Town Car, 4d | 5475 | 5230 |
| V16-Series 90 | | |
| Coupe | 7645 | 5840 |
| A. D. Coupe | 7800 | 6050 |
| Conv. Sedan | 8105 | 6100 |
| Town Sedan | 7495 | 6085 |
| Sedan, 7p | 7595 | 6190 |
| Limousine | 7800 | 6190 |
| Imp. Cabriolet | 8055 | 6210 |
| Tn. Cabriolet, 5p. | 9025 | ..... |
| Tn. Cabriolet, 7p. | 9130 | ..... |
| Sedan, 5p. | 7545 | ..... |
| Lim. Bro., 7p. | 9025 | ..... |
| Imp. Cab., 7p. | 8105 | ..... |
| Coupe, 5p. | 8105 | ..... |
| **CHEVROLET** | | |
| Master | | |
| Sedan, 4d | 667 | 2845 |
| Coach, 2d | 606 | 2800 |
| Twn. Sed., Trk., 2d | 624 | 2830 |
| Spt. Sed., Trk., 4d | 685 | 2885 |
| Bus. Coupe, 2d | 588 | 2770 |
| Cabriolet, 2d | 694 | 2790 |
| Master De Luxe | | |
| Sedan, 4d | 739 | 2935 |
| Coach, 2d | 672 | 2910 |
| Tn. Sed., Trk., 2d. | 690 | 2935 |
| Spt. Sed., Trk., 4d | 757 | 2960 |
| Bus. Coupe, 2d | 655 | 2840 |
| Sport Coupe, 2d | 693 | 2880 |
| **CHRYSLER** | | |
| Royal Six | | |
| Bus. Coupe, 2d | 810 | 3049 |
| Coupe, 2d | 860 | 3099 |
| Conv. Coupe | 1020 | 3274 |
| Tour. Bro., 2d | 880 | 3094 |
| Brougham, 2d | 870 | 3114 |
| Tour. Sedan, 4d | 920 | 3134 |
| Sedan, 4d | 910 | 3124 |
| Conv. Sedan | 1355 | 3484 |
| Sedan, 7p., 4d | 1145 | 3544 |
| Sed. Lim., 7p., 4d | 1245 | ..... |
| Imperial Eight | | |
| Bus. Coupe, 2d | 1030 | 3374 |
| Coupe, 2d | 1070 | 3449 |
| Tour. Bro., 2d | 1070 | 3544 |
| Tour. Sedan, 4d | 1100 | 3564 |
| Conv. Coupe | 1170 | 3609 |
| Conv. Sedan, 4d | 1500 | 3824 |
| Custom Imp. 8 | | |
| Sedan, 4d., 7p | 2060 | 4522 |
| Sed. Lim., 4d., 7p | 2160 | 4644 |
| Airflow | | |
| Sedan, 4d | 1610 | 4225 |
| Coupe, 2d | 1610 | 4300 |
| **CORD** | | |
| Westc. Sed., 4d | 2445 | 3715 |
| Beverly Sed., 4d | 2545 | 3800 |
| Conv. Coupe, 2d | 2595 | 3815 |
| Con. Pha. Sed., 2d | 2645 | 3864 |
| Schd. Westh. Sed. | 2860 | 3765 |
| Schd. Bevly. Sed. | 2960 | 3850 |
| Schd. Conv. Cpe. | 3010 | 3865 |
| Schd. Conv. Sed. | 3060 | 3914 |
| Cus. Berline | 3060 | 4120 |
| Cus. Beverly | 2960 | 3900 |
| S. C. Berline | 3575 | 4170 |
| S. C. Beverly | 3375 | 3950 |
| **DE SOTO** | | |
| Bus. Coupe, 2d | 770 | 3038 |
| Coupe, rumb., 2d | 820 | 3088 |
| Brougham, 2d | 830 | 3123 |
| Tour. Bro., 2d | 840 | 3148 |
| Sedan, 4d | 870 | 3123 |
| Tour. Sedan, 4d | 880 | 3148 |
| Conv. Coupe | 975 | 3225 |
| Conv. Sedan, 4d | 1300 | 3441 |
| Sedan, 7p., 4d | 1120 | 3451 |
| Limousine, 7p | 1220 | ..... |
| **DODGE** | | |
| Bus. Coupe, 2d | 715 | 2902 |
| Coupe, 2d | 770 | 2967 |
| Conv. Coupe, 2d | 910 | 3057 |
| Sedan, 2d | 780 | 2992 |
| Tour. Sedan 2d | 790 | 2997 |
| Sedan, 4d | 820 | 2982 |
| Tour. Sedan, 4d | 830 | 2997 |
| Sedan, 4d., 7p. | 1075 | 3367 |
| Conv. Sedan, 4d. | 1230 | 3262 |
| Limousine, 4d. | 1175 | ..... |
| **FORD** | | |
| V8-60 | | |
| Tudor Sedan | 544 | 2513 |
| Tud. Tour. Sed. | 569 | 2523 |
| Fordor Sedan | 604 | 2543 |
| Fordor Tr. Sed. | 629 | 2553 |
| Coupe, 5W | 529 | 2383 |
| Standard V8-85 | | |
| Tudor Sedan | 585 | 2728 |
| Tud. Tour. Sed. | 610 | 2760 |
| Fordor Sedan | 645 | 2761 |
| Fordor Tr. Sed. | 670 | 2778 |
| Coupe, 5W | 570 | 2608 |
| De Luxe V8-85 | | |
| Tudor Sedan | 648 | 2768 |
| Fordor Sedan | 708 | 2783 |
| Roadster | 693 | 2688 |
| Phaeton | 748 | 2803 |
| Coupe, 5W | 633 | 2618 |
| Tud. Tour. Sed. | 673 | 2791 |
| Fordor Tr. Sed. | 733 | 2808 |
| Cabriolet | 693 | 2728 |
| Conv. Sedan | 858 | 2973 |
| Conv. Cabriolet | 758 | 2748 |
| Club Coupe | 693 | 2728 |
| **GRAHAM** | | |
| Crusader Series 6-85 | | |
| Tour. Sedan, 2d | 690 | 2660 |
| Tr. Sed., Trk., 2d | 720 | 2675 |
| Tour. Sedan, 4d | 770 | 2695 |
| Tr. Sed., Trk., 4d | 795 | 2715 |
| Cavalier Series 6-95 | | |
| Bus. Coupe, 2d | 850 | 2815 |
| Coupe, 2d | 900 | 2880 |
| Conv. Coupe | 945 | ..... |
| Tour. Sedan, 2d | 875 | 2930 |
| Tr. Sed., Trk., 2d | 905 | 2960 |
| Tour. Sedan, 4d | 905 | 2930 |
| Tr. Sed., Trk., 4d | 935 | 2945 |
| Supercharger Series 116 | | |
| Bus. Coupe, 2d | 1015 | 2975 |
| Coupe, 2d | 1045 | 3040 |
| Conv. Coupe | 1080 | ..... |
| Tour. Sedan, 2d | 1020 | 3105 |
| Tour. Sedan, 4d | 1050 | 3125 |
| Tr. Sed., Trk., 2d | 1050 | 3105 |
| Tr. Sed., Trk., 4d | 1080 | 3125 |
| Cus. Su. Chr. Series 120 | | |
| Bus. Coupe, 2d | 1105 | 3020 |
| Coupe, 2d | 1135 | 3055 |
| Conv. Coupe | 1170 | ..... |
| Tour. Sedan, 4d | 1160 | 3200 |
| Tr. Sed., Trk., 4d | 1190 | 3200 |
| **HUDSON** | | |
| 6-73 | | |
| Bus. Coupe, 2d | 815 | ..... |
| Coupe, 3p., 2d | 860 | 2805 |
| Brougham, 4d | 885 | 2925 |
| Tour. Bro., 2d | 910 | 2925 |
| Vict. Coupe 2d | 905 | ..... |
| Sedan, 4d | 935 | 2990 |
| Tour. Sedan, 4d | 960 | 2990 |
| Conv. Coupe | 960 | ..... |
| Conv. Bro. | 1045 | ..... |
| 8-74 De Luxe | | |
| Coupe, 3p, 2d | 900 | 3010 |
| Brougham, 2d | 955 | 3105 |
| Vict. Coupe, 2d. | 970 | 3055 |
| Tour. Bro., 2d. | 980 | 3105 |
| Sedan, 4d | 995 | 3135 |
| Tour. Sedan, 4d | 1020 | 3135 |
| Conv. Coupe | 1035 | ..... |
| Conv. Bro. | 1120 | ..... |
| 8-75 Custom | | |
| Coupe, 3p, 2d | 1005 | 3055 |
| Brougham, 4d | 1045 | 3135 |
| Vict. Coupe, 2d | 1055 | 3085 |
| Tour. Bro., 2d | 1070 | 3135 |
| Sedan, 2d | 1095 | 3195 |
| Tour. Sedan, 2d | 1120 | 3195 |
| Conv. Coupe | 1130 | ..... |
| Conv. Bro. | 1215 | ..... |
| 8-76 De Luxe | | |
| Sedan, 4d | 1020 | 3205 |
| Tour. Sedan, 4d | 1045 | 3205 |
| 8-77 Custom | | |
| Sedan, 4d | 1120 | 3260 |
| Tour. Sedan, 4d | 1145 | 3260 |
| **LA SALLE** | | |
| Series 37-50 | | |
| Sport Coupe, 2d | 1095 | 3675 |
| Tour. Sedan, 2d | 1215 | 3780 |
| Tour. Sedan, 4d | 1260 | 3810 |
| Conv. Coupe, 2d | 1290 | 3715 |
| Conv. Sedan, 4d | 1620 | 3850 |
| **LINCOLN-ZEPHYR** | | |
| Coupe, 3p, 2d | 1165 | ..... |
| Sedan, 4d | 1265 | ..... |
| Coupe-sedan, 2d | 1245 | ..... |
| Town Lim., 4d | 1425 | ..... |
| **NASH** | | |
| Lafayette-400 | | |
| Coupe, 2d | 705 | 3140 |
| Coupe, 2d | 760 | 3190 |
| Vict. Sedan, 2d | 765 | 3200 |
| Sedan, 4d | 810 | 3240 |
| Cabriolet, 2d | 850 | 3180 |
| Ambassador Six | | |
| Coupe, 2d | 870 | 3290 |
| Coupe, 2d | 910 | 3340 |
| Vict. Sedan, 2d. | 910 | 3380 |
| Sedan, 4d | 960 | 3400 |
| Cabriolet, 2d | 975 | 3320 |
| Ambassador Eight | | |
| Coupe, 2d | 990 | 3590 |
| Coupe, 2d | 1030 | 3640 |
| Vict. Sedan, 2d. | 1030 | 3690 |
| Sedan, 4d | 1080 | 3720 |
| Cabriolet 2d | 1095 | 3640 |
| **OLDSMOBILE** | | |
| Six | | |
| Sedan, 2d | 825 | 3275 |
| Tr. Sed., Trk., 2d | 850 | 3275 |
| Sedan, 4d | 875 | 3310 |
| Tr. Sed., Trk., 4d | 900 | 3295 |
| Bus. Coupe, 2d | 765 | 3220 |
| Conv. Coupe, 2d. | 920 | ..... |
| Club Coupe, 2d | 825 | 3210 |
| Eight | | |
| Bus. Coupe, 2d | 880 | 3395 |
| Club Coupe, 2d | 940 | 3405 |
| Sedan, 2d | 940 | 3480 |
| Tour. Sedan, 2d | 965 | 3480 |
| Sedan, 4d | 990 | 3510 |
| Tour. Sedan, 4d | 1015 | 3495 |
| Conv. Coupe, 2d. | 1035 | ..... |
| **PACKARD** *—6 Wheel Equipment | | |
| Model 115-C | | |
| Tour. Sedan | 1010 | 3310 |
| Sedan | 995 | 3265 |
| Club Sedan | 1000 | 3275 |
| Tour. Coupe | 960 | 3235 |
| Sport Coupe | 940 | 3215 |
| Conv. Coupe | 1010 | 3285 |
| Bus. Coupe | 895 | 3140 |
| Model 120-C | | |
| Tour. Sedan | 1185 | 3520 |
| Sedan | 1170 | 3465 |
| Club Sedan | 1175 | 3455 |
| Tour. Coupe | 1135 | 3435 |
| Sport Coupe | 1110 | 3415 |
| Conv. Coupe | 1185 | 3485 |
| Conv. Sedan | 1495 | 3630 |
| Bus. Coupe | 1065 | 3340 |
| Model 120-CD-Del. | | |
| Tour. Sedan | 1400 | 3550 |
| Club Sedan | 1390 | 3485 |
| Tour. Coupe | 1350 | 3465 |
| Tour. Sed., 7p | 1835 | 3835 |
| Tour. Lim. | 1985 | 3900 |
| Model 1500 Super Eight | | |
| Tour. Sedan | 2480 | 4530 |
| Model 1501 Super Eight | | |
| Formal Sedan | 3400 | 4795 |
| Tour. Sedan | 2685 | 4670 |
| Club Sedan | 2680 | 4600 |
| Coupe | 2660 | 4595 |
| Coupe | 2565 | 4585 |
| Coupe Roadster | 2830 | 4580 |
| Victoria | 3310 | 4850 |
| Model 1502 Super Eight | | |
| Tour. Sed., 7p | 2860 | 4700 |
| Tour. Lim., 7p | 2995 | 4815 |
| Conv. Sed., 5p | 3515 | 4945 |
| Bus. Sedan | 2730 | ..... |
| Bus. Lim | 2870 | ..... |
| Model 1506 Twelve | | |
| Tour. Sedan | 3670 | 5335 |
| Model 1507 Twelve | | |
| Formal Sedan | 4455 | 5500 |
| Tour. Sedan | 3740 | 5525 |
| Club Sedan | 3845 | 5520 |
| Coupe | 3770 | 5415 |
| Coupe* | 3720 | 5255 |
| Coupe Roadster* | 3750 | 5255 |
| Victoria* | 4815 | 5345 |
| Model 1508 Twelve | | |
| Tour. Sedan | 4070 | 5600 |
| Tour. Lim. | 4275 | 5660 |
| Conv. Sedan* | 4975 | 5680 |
| **PIERCE-ARROW** | | |
| Eight Model 1701 | | |
| Sedan | 3375 | 5675 |
| Club Sedan | 3480 | 5600 |
| Coupe | 3375 | 5645 |
| Conv. Roadster | 3480 | 5590 |
| Club Berline | 3630 | ..... |
| Formal Sedan | 3630 | ..... |
| Sedan, 7 p. | 3690 | 5820 |
| Enc. Dr. Lim. | 3840 | 5860 |
| Brunn Town Bro. | 5520 | 5840 |
| Conv. Sedan | 4300 | ..... |
| Sedan, 7p | ..... | 5725 |
| Twelve Model 1702 | | |
| Sedan | 3895 | 5920 |
| Club Sedan | 4000 | 5850 |
| Coupe | 3895 | 5855 |
| Conv. Roadster | 4000 | 5800 |
| Club Berline | 4155 | ..... |
| Formal Sedan | 4155 | ..... |
| Sedan, 7 p. | 4210 | 6065 |
| Enc. Dr. Lim. | 4360 | 6105 |
| Brunn Town Bro. | 6040 | 6085 |
| Conv. Sedan | 4820 | 5921 |
| Twelve 1703 | | |
| Sedan | 5015 | 6125 |
| Enc. Dr. Lim. | 5220 | 6145 |
| **PLYMOUTH** | | |
| Six P3 | | |
| Coupe, 2d | 580 | 2771 |
| Sedan, 2d | 620 | 2841 |
| Sedan, 4d | 665 | 2841 |
| De Luxe Six-P4 | | |
| Coupe, 2p | 650 | 2839 |
| Coupe, 2-4p | 700 | 2884 |
| Conv. Coupe, 2d. | 830 | 2994 |
| Sedan, 2d | 715 | 2899 |
| Sedan, 4d | 745 | 2914 |
| Tour. Sedan, 2d | 725 | 2914 |
| Tour. Sedan, 4d | 755 | 2914 |
| Sedan, 7p | 995 | 3333 |
| Sedan Lim. | 1095 | ..... |
| **PONTIAC** | | |
| De Luxe Six | | |
| Bus. Coupe, 2d | 736 | 3140 |
| Sedan, 2d | 785 | 3225 |
| Sport Coupe, 2d | 808 | 3150 |
| Tour. Sedan, 2d | 810 | 3210 |
| Cabriolet, 2d | 900 | 3150 |
| Sedan, 4d | 836 | 3235 |
| Tour. Sedan, 4d | 861 | 3235 |
| De Luxe Eight | | |
| Bus. Coupe, 2d | 812 | 3270 |
| Sedan, 2d | 848 | 3330 |
| Sport Coupe, 2d | 868 | 3275 |
| Tour. Sedan, 2d | 874 | 3345 |
| Cabriolet, 2d | 940 | 3275 |
| Sedan, 4d | 894 | 3380 |
| Tour. Sedan, 4d | 920 | 3375 |
| **STUDEBAKER** | | |
| Dictator | | |
| Bus. Coupe, 3p | 765 | 2970 |
| Cus. Coupe, 5p | 820 | 3005 |
| Cus. Coupe, 2d | 845 | 3045 |
| Cruis. Sedan, 4d | 880 | 3140 |
| Cus. Sedan, 4d | 900 | 3130 |
| St. Reg. Cr. Sd., 2d | 850 | 3100 |
| St. Reg. Cu. Sd., 2d | 870 | 3100 |
| President | | |
| Cus. Coupe, 3p | 1085 | 3510 |
| Cus. Coupe, 5p | 1115 | 3540 |
| Cus. Sedan, 4d | 1165 | 3620 |
| Cruis. Sedan, 4d | 1185 | 3635 |
| St. Reg. Cu. Sd., 2d | 1135 | 3600 |
| St. Reg. Cr. Sd., 2d | 1155 | 3610 |
| **TERRAPLANE** | | |
| 6-71 De Luxe | | |
| Bus. Coupe, 2d | 695 | 2670 |
| Coupe, 3p, 2d | 715 | 2715 |
| Brougham, 2d | 735 | 2830 |
| Tour. Bro., 2d | 755 | ..... |
| Victoria, 2d | 760 | ..... |
| Sedan, 4d | 790 | 2865 |
| Tour. Sedan, 4d | 810 | ..... |
| Conv. Coupe | 835 | 2755 |
| Conv. Bro. | 915 | 2870 |
| 6-72 Super. | | |
| Coupe, 3p, 2d | 795 | 2755 |
| Brougham, 2d | 815 | 2875 |
| Tour. Bro., 2d | 835 | ..... |
| Victoria, 2d | 835 | 2795 |
| Sedan, 4d | 865 | 2905 |
| Tour, Sedan, 4d | 885 | ..... |
| Conv. Coupe | 905 | 2825 |
| Conv. Bro. | 985 | 2915 |
| **WILLYS** | | |
| Model 37 | | |
| Coupe, 2d | 491 | 2120 |
| Sedan, 4d | 545 | 2250 |
| De L. Coupe | 535 | ..... |
| De L. Sedan | 590 | ..... |

**(Specifications continued on page 70)**

# *You need this*

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# DAYRAD *TESTING EQUIPMENT*

## *to successfully handle auto radio service!*

**Combination Unit (Series 200) with stand** **$104.50**

FOR quick inspection of auto (or household) radio sets, the popular Bendix-DayRad Series 200 Combination Testing Unit provides utmost flexibility and accuracy. More than two hundred types of tubes may be tested, including the new metal, Octal "G" and "MG" types. Operation on 110-Volt A.C., 60-cycles.

The Portable Service Stand pictured (and included in the price) provides a splendid means of merchandising tubes. There is ample drawer space for tube and supply storage. It may be wheeled on its rubber-tired casters up close to a car or a set to be tested.

Allows complete point-to-point analysis of auto or household radio sets—checking batteries for voltage and amperage—checking high-tension coils and ignition circuits for continuity—checking condensers for shorts. Size: 15″ wide, 14″ deep, 4″ high. Weight: 15 lbs.

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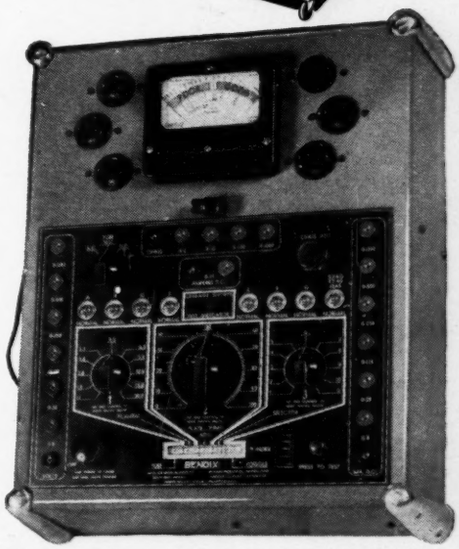


A turn of the switch transforms this unit into a sensitive volt-ohmmeter.

Reads AC voltages from 0 to 1250
Reads DC voltages from 0 to 1250
Reads Milliamperes from 0 to 1250
Reads Ohms from 0 to 30,000
Reads Ohms from 0 to 300,000
Reads Ohms from 0 to 3,000,000
Reads Amperes from 0 to 25

(All ranges to an accuracy of 2% plus or minus)

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Send me complete information regarding your new Bendix-DayRad Series 200 Testing Unit, also your new catalog of Bendix DayRad Radio Service Instruments.

*Name* .....
*Street* .....
*City* ..... *State* .....
*My Jobber's Name* .....

# Tune Up Specifications—(1928 to 1937 Inclusive)

| MAKE AND MODEL | No. of Cylinders and Bore and Stroke | VALVES: Inlet Tappet Clearance for Valve Timing | VALVES: Intake Valve Opens Before or After T. C. — No. of Degrees (E=Exhaust Valve) | VALVES: Intake Valve Opens Before or After T. C. — No. of Flywheel Teeth (E=Exhaust Valve) | VALVES: Operating Tappet Clearance — Intake | VALVES: Operating Tappet Clearance — Exhaust | Rods Removed from | IGNITION: Spark Plug — Make and Model | IGNITION: Spark Plug — Gap | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — Spark Occurs °TC | IGNITION: Timing — No. of Flywheel Teeth Spark Occurs TC | IGNITION: Timing — Breaker Gap | IGNITION: Timing — Breaker Housing | Capacity Crank Case (Qts.) | Capacity Cooling System (Qts.) | Compression Pressure at Cranking Speed (Lbs.) (Standard Head) | CRANK-PIN: Diameter | CRANK-PIN: Length | FRONT AXLE: Caster (Degrees) | FRONT AXLE: Camber (Degrees) | FRONT AXLE: Toe-in (Inches) | FRONT AXLE: Kingpin Inclination (Degrees) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Auburn 6-80 ..... 1929 | 6-2 7/16 x 4 3/4 | .010 | E-10A.. | E-2 3/4 A. | .008H | .008H | B.. | Ch-C4... | .025 | ..... | (a) | .021 | A... | 6 | 19 | 78 | 2 1/16 | 1 1/4 | 2 1/4 E | 2 | 1/16-1/4 | 7 |
| Auburn 8-90 ..... 1929 | 8-2 7/16 x 2 3/4 | .010 | E-10A.. | E-2 1/4 A. | .008H | .008H | B.. | Ch-C4... | .027 | 10 1/2 B.. | 3B..... | .021 | A... | 8 | 22 | 78 | 2 1/16 | 1 1/4 | 2 1/4 E | 2 | 1/16-1/4 | 7 |
| Auburn 120 ..... 1929 | 8-3 1/4 x 4 1/2 | .010 | E-10A.. | E-3 1/2 A. | .007H | .007H | B.. | Ch-C4... | .027 | 13 1/2 B.. | 4 1/2 B.. | .021 | A... | 8 | 22 | 103 | 2 1/8 | 1 1/2 | 2 1/2 E | 2 | 1/4 | 7 |
| Auburn 6-85 ..... 1930 | 6-2 7/16 x 4 3/4 | .010 | E-10A.. | E-2 3/4 A. | .008H | .008H | B.. | Ch-C4... | .025 | 8 1/2 B.. | 2 1/2 B.. | .021 | A... | 6 | 19 | 90 | 2 1/8 | 1 1/4 | 2 1/2 E | 2 | 1/8-1/4 | 7 |
| Auburn 8-95 ..... 1930 | 8-2 7/16 x 4 3/4 | .010 | E-10A.. | E-2 1/4 A. | .008H | .008H | B.. | Ch-2..... | .027 | 10 1/2 B.. | 3B..... | .022 | A... | 7 | ..... | 82 | 2 1/8 | 1 1/4 | 2 1/2 E | 2 | 1/8-1/4 | 7 |
| Auburn 125 ..... 1930 | 8-3 1/4 x 4 1/2 | .010 | F-10A.. | E-3 1/2 A. | .007H | .007H | B.. | Ch C4... | .027 | 13 1/2 B.. | 4 1/2 B.. | .021 | A... | 8 | 25 | 105 | 2 1/8 | 1 1/2 | 2 1/2 E | 2 | 1/8 | 7 |
| Auburn 8-98 & 8-98A ..... 1931 | 8-3 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-2..... | .027 | 13B..... | 3 3/4 B.. | .021 | A... | 8 | 21 | 83 | 2 1/8 | 1 1/4 | 1-2E | 2 | 1/8-1/4 | 7 |
| Auburn 8-100 ..... 1932-33 | 8-3 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-C4... | .027 | 13B..... | 3 3/4 B.. | .021 | A... | 8 | 21 | 83 | 2 1/8 | 1 1/4 | 1-2E | 2 | 1/8-1/4 | 7 |
| Auburn 8-100A ..... 1932 | 8-3 x 4 3/4 | .012 | 5B..... | 1 1/4 B.. | .007H | .007H | B.. | Ch-2..... | .026 | 12 1/2 B.. | 3 3/4 B.. | .021 | A... | 8 | 19 | 84 | 2 1/8 | 1 1/4 | 1-2E | 2 | 1/8-1/4 | 7 |
| Auburn 12-160 ..... 1932 | 12-3 1/2 x 4 1/4 | .015 | TC..... | TC..... | .010H | .010H | B.. | Ch-C7... | .025 | 11B..... | 3 1/4 B.. | .021 | A... | 9 | 37 | 89 | 2 1/4 | 1 1/4 | 1 1/4-2E | 2 | 1/8 | 7 |
| Auburn 12-160A ..... 1932 | 12-3 1/2 x 4 1/4 | .015 | TC..... | TC..... | .010H | .010H | B.. | Ch-C7... | .025 | 11B..... | 3 1/4 B.. | .021 | A... | 9 | 37 | 89 | 2 1/4 | 1 1/4 | 1 1/2-2E | 2 | 1/8 | 7 |
| Auburn 8-101 ..... 1933 | 8-3 x 4 3/4 | .012 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-C4... | .027 | 13B..... | 3 3/4 B.. | .021 | A... | 8 | 21 | 83 | 2 1/8 | 1 1/4 | 1-2E | 2 | 1/8-1/4 | 7 |
| Auburn 8-101A ..... 1933 | 8-3 x 4 3/4 | .010 | 5B..... | 1 1/4 B.. | .007H | .007H | B.. | Ch-2..... | .026 | 12 1/2 B.. | 3 3/4 B.. | .021 | A... | 8 | 19 | 84 | 2 1/8 | 1 1/4 | 1-2E | 2 | 1/8-1/4 | 7 |
| Auburn 12-161 ..... 1933 | 12-3 1/2 x 4 1/4 | .015 | TC..... | TC..... | .010H | .010H | B.. | Ch-C7... | .025 | 11B..... | 3 1/4 B.. | .021 | A... | 9 | 37 | 89 | 2 1/4 | 2 1/2 | 1 1/4-2E | 2 | 1/8 | 7 |
| Auburn 12-161A ..... 1933 | 12-3 1/2 x 4 1/4 | .015 | TC..... | TC..... | .010H | .010H | B.. | Ch-C7... | .025 | 11B..... | 3 1/4 B.. | .021 | A... | 9 | 37 | 89 | 2 1/4 | 2 1/2 | 1 1/2-2E | 2 | 1/8 | 7 |
| Auburn 8-105 ..... 1933 | 8-3 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-2..... | .026 | 12 1/2 B.. | 4B..... | .021 | A... | 8 | 19 | 82 | 2 1/16 | 1 1/4 | 1-2E | 2 | 1/8-1/4 | 7 |
| Auburn 12-165 ..... 1933 | 12-3 1/2 x 4 1/4 | .015 | TC..... | TC..... | .010H | .010H | B.. | Ch-C7... | .025 | 11B..... | 3 1/4 B.. | .021 | A... | 9 | 37 | 89 | 2 1/4 | 1 1/4 | 1 1/4-2E | 2 | 1/8 | 7 |
| Auburn 1250 ..... 1934 | 12-3 1/2 x 4 1/4 | .015 | TC..... | TC..... | .010H | .010H | B.. | Ch-C7... | .025 | 11B..... | 3 1/4 B.. | .021 | A... | 9 | 37 | 89 | 2 1/4 | 1 1/4 | 1 1/2-2 1/2 E | 2 | 1/8-1/4 | 7 |
| Auburn 652X ..... 1934 | 6-3 1/16 x 4 3/4 | .010 | 5B..... | 1 1/4 B.. | .007H | .007H | B.. | Ch-J6... | .025 | 3B..... | 1B..... | .019 | Au.. | 6 | 17 1/2 | 103 | 2 1/4 | 1 1/4 | 1-2E | 1 1/4 | 1/8-1/4 | 7 1/2 |
| Auburn 652Y ..... 1934 | 6-3 1/16 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-J6... | .025 | 3B..... | 1B..... | .019 | Au.. | 6 | 17 1/2 | 103 | 2 1/4 | 1 1/4 | 1-2E | 1 1/2 | 1/8-1/4 | 7 1/2 |
| Auburn 850X ..... 1934 | 8-3 1/16 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-7..... | .025 | 3B..... | 1B..... | .015 | Au. | 8 | 20 | 83 | 2 1/2 | 1 1/4 | 1-2E | 1 1/2 | 1/8-1/4 | 7 1/2 |
| Auburn 850Y ..... 1934 | 8-3 1/16 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-J6... | .025 | 3B..... | 1B..... | .015 | Au.. | 8 | 21 | 103 | 2 1/4 | 1 1/4 | 1 2E | 1 1/2 | 1/8-1/4 | 7 1/2 |
| Auburn 653 ..... 1935 | 6-3 1/16 x 4 3/4 | .010 | 5B..... | 1 1/2 R.. | .007H | .007H | B.. | Ch-J6... | .025 | 3B..... | 1B..... | .019 | Au.. | 6 | 17 1/2 | 103 | 2 1/4 | 1 1/4 | 3 1/4-4 | 1 1/2 | 1/8-1/4 | 7 1/2 |
| Auburn 851 ..... 1935 | 8-3 1/16 x 4 3/4 | .010 | 5B..... | 1 1/2 B.. | .007H | .007H | B.. | Ch-7..... | .025 | 3B..... | 1B..... | .015 | Au. | 8 | 20 | 103 | 2 1/16 | 1 1/4 | 1-2E | 1 1/2 | 1/8-1/4 | 7 1/2 |
| Auburn 654 ..... 1936 | 6-3 1/16 x 4 3/4 | .012 | 7 1/4 B.. | 2 1/4 B.. | .010H | .010H | B.. | Ch-J6... | .025 | 3B..... | 1B..... | .018 | Au. | 6 | 16 | 103 | 2 1/16 | 1 1/4 | 3 1/4-4 | 1 1/2 | 1/8 | 7 1/2 |
| Auburn 852 ..... 1936 | 8-3 1/16 x 4 3/4 | .012 | 7 1/2 B.. | 2 1/4 B.. | .010H | .010H | B.. | Ch-J6... | .025 | 3B..... | 1B..... | .018 | Au.. | 8 | 20 | 110 | 2 1/16 | 1 1/4 | 2-3 | 1 1/2 | 1/8 | 7 1/2 |
| Auburn SC-852 ..... 1936 | 8-3 1/16 x 4 3/4 | .012 | 7 1/2 B.. | 2 1/4 B.. | .010H | .010H | B.. | Ch-J9B... | .025 | 3B..... | 1B..... | .013 | Au.. | 8 | 20 | 110 | 2 1/16 | 1 1/4 | 2-3 | 1 1/2 | 1/8 | 7 1/2 |
| Austin ..... 1930-31-32 | 4-2.2x3 | .... | TC..... | TC..... | .003H | .004H | Rbp | Ch-C7 | .027 | .020B.. | ..... | .020 | .... | 2 1/2 | 6 | 76 | 1 1/16 | 1 1/4 | 5 | 2 3/4 | 1/16-1/8 | ..... |
| Austin ..... 1931-32-33 | 4-2.2x3 | .003 | TC..... | TC..... | .003H | .004H | B.. | Ch-C7 | .027 | .020B.. | ..... | .020 | .... | 2 1/2 | 6 | 76 | 1 1/16 | 1 1/4 | 5 | ..... | 1/16 | 1 1/2 |
| Austin 375 ..... 1933-34-35-36 | 4-2 2x3 | .005 | TC..... | TC..... | .005H | .007H | B.. | Ch-C7 | .027 | .020B.. | ..... | .018 | Re.. | 2 1/2 | 6 | 76 | 1 1/16 | 1 1/4 | 5 | 1 1/4 | 1/16 ± 1/32 | 1 1/2 |
| Buick 116 ..... 1929 | 6-3 1/16 x 4 5/8 | .008 | 17..... | 2 1/4 B.. | .008H | .008H | B.. | AC-G14.. | .025 | 17B..... | 5 3/4 B.. | .020 | A... | 7 1/2 | 17 | 63 | 2 1/16 | 1 1/2 | 1-2 1/4 E | 1-2 | 1/8-1/4 | 7 1/2 |
| Buick 121-129 ..... 1929 | 6-3 1/16 x 4 3/4 | .008 | 12 1/2 A.. | 4 1/2 B.. | .008H | .008H | B.. | AC-G14.. | .027 | 17B..... | 6B..... | .021 | A... | 6 1/2 | 23 | 63 | 2 5/16 | 1 3/4 | 1/2-2E | 1-2 | 1/8-1/4 | 7 1/2 |
| Buick 40 ..... 1930 | 6-3 1/16 x 4 5/8 | .008 | 10 1/2 B.. | 3 1/2 B.. | .008H | .008H | B.. | AC-G14.. | .027 | 15B..... | 5B..... | .018 | A... | 5 1/2 | 16 | 67 | 2 1/16 | 1 1/2 | 1-2 1/2 E | 1-2 | 1/8-1/4 | 8 |
| Buick 50 ..... 1930 | 6-3 1/4 x 5 | .008 | 12 1/2 A.. | 4A..... | .008H | .008H | B.. | AC-G14.. | .025 | 17B..... | 6B..... | .018 | A... | 6 | 22 | 63 | 2 5/16 | 1 3/4 | 1-2 1/2 E | 1-2 | 1/8-1/4 | 8 |
| Buick 60 ..... 1930 | 6-3 1/4 x 5 | .008 | 12 1/2 A.. | 4A..... | .008H | .008H | B.. | AC-G14.. | .027 | 17B..... | 6B..... | .018 | A... | 6 | 22 | 63 | 2 5/16 | 1 3/4 | 1-2 1/2 E | 1-2 | 1/8-1/4 | 8 |
| Buick 8-50 ..... 1931 | 8-2 7/16 x 4 1/4 | .008 | 10 1/2 B.. | 3 1/2 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 12B..... | 4B..... | .018 | A... | 7 | 12 | 70 | 2 1/16 | 1 1/8 | 1 1/2-2E | 1-1 3/4 | 1/8-1/4 | 9 1/2 |
| Buick 8-60 ..... 1931 | 8-3 1/16 x 4 5/8 | .008 | 10 1/2 B.. | 3 1/2 R.. | .008H | .008H | B.. | AC-J12.. | .027 | 11R..... | 3 3/4 | .018 | A... | 7 | 12 | 70 | 2 1/16 | 1 1/8 | 1 1/2-2E | 1 1/4-2 | 1/8-1/4 | 8 |
| Buick 8-80 ..... 1931 | 8-3 1/16 x 5 | .008 | 10 1/2 B.. | 3 1/2 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 10B..... | 3 1/2 B.. | .018 | A... | 9 | 19 | 66 | 2 5/16 | 1 1/8 | 1 1/2-2E | 1 1/4-2 | 1/8-1/4 | 8 |
| Buick 8-90 ..... 1931 | 8-3 1/16 x 5 | .008 | 10 1/2 B.. | 3 1/2 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 10B..... | 3 1/2 B.. | .018 | A... | 9 | 19 | 66 | 2 5/16 | 1 1/8 | 1 1/2-2E | 1 1/4 2 | 1/8-1/4 | 8 |
| Buick 50 ..... 1932 | 8-2 1/16 x 4 1/4 | .008 | 13 1/2 B.. | 5 1/2 B.. | .008H | .008H | B.. | AC-J12.. | .022 | 7B..... | 3B..... | .020 | A... | 7 | 12 | 60 | 2 1/16 | 1 1/8 | 1-2 | 1-2 | 1/8-1/4 | 9 1/2 |
| Buick 60 ..... 1932 | 8-3 1/16 x 4 5/8 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 11B..... | 4 3/4 B.. | .020 | A... | 8 | 16 | 69 | 2 1/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 8 |
| Buick 80 ..... 1932 | 8-3 1/16 x 5 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 10B..... | 4 1/4 B.. | .020 | A... | 9 | 19 | 64 | 2 5/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 8 |
| Buick 90 ..... 1932 | 8-3 1/16 x 5 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 10B..... | 4 1/4 B.. | .020 | A... | 9 | 19 | 64 | 2 5/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 8 |
| Buick 33-50 ..... 1933 | 8-2 1/16 x 4 1/4 | .008 | 13 1/2 B.. | 5 1/2 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 7B..... | 3B..... | .020 | A... | 7 | 16 | 74 | 2 1/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 9 1/2 |
| Buick 33-60 ..... 1933 | 8-3 1/16 x 4 5/8 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 11B..... | 4 3/4 B.. | .020 | A... | 8 | 19 | 74 | 2 1/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 8 |
| Buick 33-80 ..... 1933 | 8-3 1/16 x 5 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 10B..... | 4 1/4 B.. | .020 | A... | 9 | 19 | 64 | 2 5/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 8 |
| Buick 33-90 ..... 1933 | 8-3 1/16 x 5 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-J12.. | .027 | 10B..... | 4 1/4 B.. | .020 | A... | 9 | 19 | 64 | 2 5/16 | 1 1/8 | 1 1/2-2 | 1-2 | 1/8-1/4 | 8 |
| Buick 34-40, 35-40 ..... 1934-35 | 8-3 1/16 x 3 7/8 | .008 | 4 1/2 B.. | 2B..... | .008H | .008H | B.. | AC-H9.. | .025 | 2B..... | 1B..... | .015 | A... | 7 | 14 | 88 | 2 | 1 1/4 | 2 3/4-3 1/4 E | 0-3/4 | 0-1/4 | 4 1/2 (b) |
| Buick 34-50, 35-50 ..... 1934-35 | 8-2 13/16 x 4 1/4 | .008 | 13 1/2 B.. | 5 1/2 B.. | .008H | .008H | B.. | AC-H9.. | .022 | 7B..... | 2 3/4 B.. | .015 | A... | 7 | 15 | 82 | 2 1/16 | 1 3/4 | 1-2 1/4 E | 0-3/4 | 0-1/4 | 5 1/2 (b) |
| Buick 34-60, 35-60 ..... 1934-35 | 8-3 1/16 x 4 5/8 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-H9.. | .022 | 11B..... | 4 3/4 B.. | .015 | A... | 8 | 18 | 82 | 2 1/16 | 1 1/8 | 1-1 1/4 E | 0-3/4 | 0-1/4 | 5 1/2 (b) |
| Buick 34-90, 35-90 ..... 1934-35 | 8-3 1/16 x 5 | .008 | 13 1/2 B.. | 5 3/4 B.. | .008H | .008H | B.. | AC-H9.. | .022 | 10B..... | 4 3/4 B.. | .015 | A... | 9 | 23 | 74 | 2 5/16 | 1 1/8 | 1-1 1/4 E | 0-3/4 | 0-1/4 | 5 1/2 (b) |
| Buick 36-40 ..... 1936 | 8-3 1/16 x 3 7/8 | .004 | 8B..... | 3 1/4 B.. | .015H | .015H | A... | AC-H9.. | .025 | 2B..... | 3/4 B.. | .015 | 1/2 A. | 6 | 13 1/4 | 118† | 2 | 1 1/4 | 3-3 1/2 | 1/2N-1P | 1/16-1/8 | 3 1/2-4 1/2 |
| Buick 36-60 ..... 1936 | 8-3 1/16 x 4 1/8 | .004 | 13B..... | 5 1/2 B.. | .015H | .015H | A... | AC-H9.. | .025 | 10B..... | 4 1/2 B.. | .015 | 1/2 A. | 8 | 17 | 108† | 2 1/4 | 1 1/8 | 1 3/4-2 1/4 E | 1/2N-1P | 1/16-1/8 | 4 1/2-5 1/4 |
| Buick 36-80 ..... 1936 | 8-3 1/16 x 4 1/8 | .004 | 13B..... | 5 1/2 B.. | .015H | .015H | A... | AC-H9.. | .025 | 10B..... | 4 1/2 B.. | .015 | 1/2 A. | 8 | 17 | 108† | 2 1/4 | 1 1/8 | 1 3/4-2 1/4 | 1/2N-1P | 1/16-1/8 | 4 1/2-5 1/4 |
| Buick 36-90 ..... 1936 | 8-3 1/16 x 4 1/8 | .004 | 13B..... | 5 1/2 B.. | .015H | .015H | A... | AC-H9.. | .025 | 10B..... | 4 1/2 B.. | .015 | 1/2 A. | 8 | 17 | 108† | 2 1/4 | 1 1/8 | 3/4-1 1/4 | 0N5 1P | 1/16-1/8 | 4-5 |
| Buick 37-40 ..... 1937 | 8-3 1/16 x 4 1/16 | .004 | 13B..... | 5 1/4 B.. | .015H | .015H | A... | AC-H9.. | .024 | 2B..... | 3/4 B.. | .015 | Au.. | 6 | 13 1/4 | 120† | 2 | 1 1/16 | 1/4-± 5/16 | 1/2N-1P | 0-1/16 | 3 1/2-4 1/2 |
| Buick 37-60 ..... 1937 | 8-3 1/16 x 4 1/8 | .004 | 14B..... | 6B..... | .015H | .015H | A... | AC-H9.. | .024 | 10B..... | 4 1/2 B.. | .015 | Au.. | 8 | 17 | 119† | 2 1/4 | 1 1/8 | 1/4-± 5/16 | 1/2N-1P | 0-1/16 | 3 1/2-4 1/2 |
| Buick 37-80 ..... 1937 | 8-3 1/16 x 4 1/8 | .004 | 14B..... | 6B..... | .015H | .015H | A... | AC-H9.. | .024 | 10B..... | 4 1/2 B.. | .015 | Au.. | 8 | 17 | 119† | 2 1/4 | 1 1/8 | 0-± 3/16 | 1/2N-1P | 0-1/16 | 4 1/4-5 1/4 |
| Buick 37-90 ..... 1937 | 8-3 1/16 x 4 1/8 | .004 | 14B..... | 6B..... | .015H | .105H | A... | AC-H9.. | .024 | 10B..... | 4B 1/2 .. | .015 | Au.. | 8 | 17 | 119† | 2 1/4 | 1 1/8 | 0-± 3/16 | 1/2N-1P | 0-1/16 | 4-5 |
| Cadillac V8-341B ..... 1929 | 8-3 1/16 x 4 1/16 | .004 | 9 1/2 B.. | 3B..... | .004C | .006C | B.. | AC-G10.. | .026 | 1/4 B* | ..... | .022 | A .. | 8 | 24 | 70 | 2 3/16 | 2 3/4 | (c) | 2 1/2 | 1/4 | 5 |
| Cadillac V8-353 ..... 1930 | 8-3 5/16 x 4 1/16 | .004 | 9 1/2 B.. | 3B..... | .004C | .006C | B.. | AC-G10.. | .026 | 18 1/2 B.. | 5 1/2 B.. | .021 | A... | 8 | 24 | 71 | 2 5/16 | 2 3/4 | 2 1/4 E | 1 1/2 | 1/4 | 10 1/4 |
| Cadillac V16-452 ..... 1930-31 | 16-3 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-(e) | .026 | 10 1/2 B.. | 3B..... | .016 | A... | 10 | ..... | 84 | 2 1/2 | 2 1/4 | 2 1/2 E | 1 1/2 | 1/4 | 8 1/2 (d) |
| Cadillac V8-355 ..... 1931 | 8-3 5/16 x 4 1/16 | .004 | 9 1/2 B.. | 3B..... | .004C | .006C | B.. | AC-G7... | .026 | 7 1/2 B.. | 2 1/2 B.. | .021 | A... | 8 | 24 | 76 | 2 5/16 | 2 3/4 | 2 1/2-3E | 1 1/2 | 1/4 | 8 1/2 |
| Cadillac V12-370 ..... 1931 | 12-3 1/2 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G7... | .026 | 15B..... | 4B..... | .021 | A.. | 9 | 26 | 84 | 2 1/2 | 2 1/4 | 2 1/2-3E | 1 1/2 | 1/4 | 8 1/2 |
| Cadillac V8-355B ..... 1932 | 8-3 5/16 x 4 1/16 | .006 | 6B..... | 1 3/4 B.. | .006C | .008C | B.. | AC-G10.. | .026 | 9B..... | 2 3/4 B.. | .020 | Au.. | 8 | 26 | 88 | 2 5/16 | 2 3/4 | 2 1/4-2 1/2 | 1 1/2 | 1/8-1/4 | 7 3/4 |
| Cadillac V12-370B ..... 1932 | 12-3 1/2 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G7... | .026 | 15B..... | 4 3/4 B.. | .021 | Au.. | 9 | 24 | 79 | 2 1/2 | 2 1/4 | 2 1/2-3 1/2 E | 1 1/2 | 1/4 | 7 3/4 |
| Cadillac V16-452B ..... 1932 | 16-3 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G7... | .026 | 10 1/4 B.. | 3 1/4 B.. | .016 | Au. | 10 | 28 | 81 | 2 1/2 | 2 1/4 | 2 1/2-3 1/2 E | 1 1/2 | 1/4 | 7 3/4 |
| Cadillac V8-355C ..... 1933 | 8-3 5/16 x 4 1/16 | .006 | 6B..... | 1 3/4 B.. | .006C | .008C | B.. | AC-G7... | .026 | 9B..... | 2 3/4 B.. | .021 | Au.. | 8 | 26 | 88 | 2 5/16 | 2 3/4 | 2 1/4-3 1/2 | 1 1/2 | 1/8-1/4 | 7 3/4 |
| Cadillac V12-370C ..... 1933 | 12-3 1/2 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G7... | .026 | 4B..... | 1 1/4 B.. | .021 | Au | 9 | 24 | 91 | 2 1/2 | 2 1/4 | 2 1/2-3 1/2 E | 1 1/2 | 1/4 | 7 3/4 |
| Cadillac V16-452C ..... 1933 | 16-3 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G7... | .026 | 4B..... | 1 1/4 B.. | .016 | Au.. | 10 | 28 | 93 | 2 1/2 | 2 1/4 | 2 1/2-3 1/2 E | 1 1/2 | 1/4 | 7 3/4 |
| Cadillac V8-355D ..... 1934-35 | 8-3 5/16 x 4 1/16 | .006 | 6B..... | 1 3/4 B.. | .006C | .010C | B.. | AC-G7... | .026 | 4B..... | 1B..... | .015 | Au.. | 8 | 20 | 99 | 2 5/16 | 2 3/4 | 1-2E | 3/4-1 1/2 | 1/8-1/4 | 5 |
| Cadillac V12-370D ..... 1934-35 | 12-3 1/2 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G6... | .026 | 4B..... | 1B..... | .021 | Au. | 9 | 19 | 99 | 2 1/2 | 2 1/4 | 1-2E | 3/4-1 1/2 | 1/8-1/4 | 5 |
| Cadillac V16-452D ..... 1934-35 | 16-3 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G6... | .026 | 4B..... | 1B..... | .016 | Au. | 10 | 23 | 94 | 2 1/2 | 2 1/4 | 1-2E | 3/4-1 1/2 | 1/8-1/4 | 5 |
| Cadillac V8-60 ..... 1936 | 8-3 5/16 x 4 1/2 | .000 | TC..... | TC..... | AA... | AA... | A.. | AC-K9.. | .026 | 5B..... | 2B..... | .015 | Au. | 7 | 30 | 103 | 2.46 | 2 1/2 | 1 1/2-2 | 1/4-1 | 0-1/2 | 4°-51′ |
| Cadillac V8-70 & 75 ..... 1936 | 8-3 1/2 x 4 1/2 | .000 | TC..... | TC..... | AA... | AA... | A.. | AC-K9.. | .026 | 5B..... | 2B..... | .015 | Au.. | 7 | 29 | 103 | 2.46 | 2 1/2 | 3/4-1 1/4 | 0-1/2 | 0-1/2 | 5°-38′ |
| Cadillac V12-80 & 85 ..... 1936 | 12-3 1/2 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G6... | .026 | 4B..... | 1 1/4 B.. | .021 | Au. | 9 | 19 | 99 | 2 1/2 | 2 1/4 | 3/4-1 1/4 | 0-1/2 | 0-1/2 | 5°-38′ |
| Cadillac V16-90 ..... 1936 | 16-3 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G6... | .026 | 4B..... | 1 1/4 B.. | .016 | Au. | 10 | 24 | 99 | 2 1/2 | 2 1/4 | 1 1/2 | 1 | 1/8-1/4 | 4 |
| Cadillac V8-60 ..... 1937 | 8-3 1/16 x 4 1/2 | .000 | TC..... | TC..... | AA... | AA... | A.. | AC-K7... | .027 | 5B..... | 2 1/4 B.. | .015 | Ad.. | 7 | 25 | 155† | 2 1/16 | 2 1/2 | 1/4-1 | 1/4-1 | 1/16-1/8 | 4°-51′ |
| Cadillac V8, 65, 70, 75 ..... 1937 | 8-3 1/2 x 4 1/2 | .000 | TC..... | TC..... | AA... | AA... | A.. | AC-K7... | .027 | 5B..... | 2 1/4 B.. | .015 | Ad.. | 7 | 25 | 170† | 2 1/16 | 2 1/2 | 0-± 1/4 | 0-1/2 | 1/16-1/8 | 5°-38′ |
| Cadillac V12-85 ..... 1937 | 12-3 1/2 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G7... | .025 | 10B..... | 3B..... | .021 | Ad.. | 9 | 17 | 145† | 2 1/2 | 2 1/4 | 0-± 1/4 | 0-1/2 | 0-1/16 | 5°-38′ |
| Cadillac V16-90 ..... 1937 | 16-3 x 4 | .000 | TC..... | TC..... | AA... | AA... | B.. | AC-G6... | .025 | 4B..... | 1 1/4 B.. | .016 | Ad.. | 10 | 24 | 154† | 2 1/2 | 2 1/4 | 0-± 1/4 | 0-1/2 | 0-1/16 | 4 1/2° |
| Chevrolet AC ..... 1929 | 6-3 1/16 x 3 3/4 | .010 | 4A..... | 1 1/2 A.. | .006H | .008H | A... | AC-12.... | .025 | 12B..... | 3 1/4 B.. | .021 | A... | 5 | 11 1/2 | 76 | 2 | 1 5/16 | 3 1/2 E | 1 1/2 | 0-1/8 | 7 1/16 |
| Chevrolet AD-Universal ..... 1930 | 6-3 1/16 x 3 3/4 | .010 | 4A..... | 1 1/4 A.. | .006H | .008H | A... | AC-G12.. | .023 | 12B..... | 3 1/4 B.. | .020 | A... | 5 | 10 | 76 | 2 | 1 5/16 | 2 1/4 E | 1 1/2 | 1/16-1/8 | 7 1/16 |
| Chevrolet AE-Independent ..... 1931 | 6-3 1/16 x 3 3/4 | .010 | 4A..... | 1 1/4 A.. | .006H | .008H | A... | AC-G12.. | .023 | 12B..... | 3 1/4 B.. | .020 | A... | 5 1/2 | 11 1/2 | 76 | 2 | 1 5/16 | 2 1/4 E | 1 1/2 | 1/16-1/8 | 7 1/16 |
| Chevrolet BA-Confederate ..... 1932 | 6-3 1/16 x 3 3/4 | .010 | 4B..... | 1B..... | .006H | .008H | A... | AC-G10.. | .024 | 12B..... | 3 3/4 B.. | .018 | A... | 5 | 10 | 80 | 2 1/16 | 1 11/16 | 2 1/4 E | 1 1/2 | 1/16-1/8 | 7 1/16 |
| Chevrolet CC-Standard ..... 1933 | 6-3 1/16 x 3 1/2 | .010 | 4B..... | 1 1/4 B.. | .006H | .008H | A... | AC-K9.. | .032 | 10B..... | 3B..... | .018 | Au.. | 4 1/2 | 9 | 80 | 2 1/16 | 1 3/16 | 1/2-1 13/16 E | 1 | 1/16-1/8 | 7 1/16 |
| Chevrolet CA-Master ..... 1933 | 6-3 1/16 x 4 | .010 | 4B..... | 1 1/2 B.. | .006H | .008H | A... | AC-K9.. | .032 | 10B..... | 3B..... | .018 | Au.. | 5 | 10 1/2 | 80 | 2 1/16 | 1 13/16 | 1/2-1 13/16 E | 1 | 1/16-1/8 | 7 1/16 |
| Chevrolet DC-Standard ..... 1934 | 6-3 1/16 x 3 1/2 | .010 | 4B..... | 1B..... | .006H | .013H | A... | AC-K9.. | .032 | 10B..... | 3B..... | .018 | Au.. | 4 1/2 | 10 | 80 | 2 1/16 | 1 3/16 | 1/4-2 1/4 E | 1/2-1 13/16 | 1/16-1/8 | 7 |
| Chevrolet DA-Master ..... 1934 | 6-3 1/16 x 4 | .010 | 4B..... | 1 1/2 B.. | .006H | .013H | A... | AC-K10.. | .032 | 10B..... | 3 3/4 B.. | .018 | Au.. | 5 | 10 1/2 | 83 | 2 1/16 | 1 3/16 | 0 | 1 | 1/16-1/8 | 7 1/16 |
| Chevrolet EC-Standard ..... 1935 | 6-3 1/16 x 4 | .006 | 4B..... | 1 1/2 B.. | .006H | .013H | A... | AC-K11.. | .032 | 5B..... | 2B..... | .018 | Au.. | 5 | 10 | 86 | 2 1/16 | 1 3/16 | 1/4-2 1/4 E | 1/2-1 13/16 | 1/16-1/8 | 7 1/16 |
| Chevrolet EA-Master Ind. ..... 1935 | 6-3 1/16 x 4 | .006 | 4B..... | 1 1/2 B.. | .006H | .013H | A... | AC-K11.. | .032 | 5B..... | 2B..... | .018 | Au.. | 5 | 12 | 86 | 2 1/16 | 1 3/16 | 0 | 1/4 | 1/16-1/8 | 7 1/16 |
| Chevrolet ED-Master Con. ..... 1935 | 6-3 1/16 x 4 | .006 | 4B..... | 1 1/2 B.. | .006H | .013H | A... | AC-K11.. | .032 | 5B..... | 2B..... | .018 | Au.. | 5 | 12 | 86 | 2 1/16 | 1 3/16 | 3E ± 1/32 | 1 ± 1/32 | 1/16-1/8 | 7 1/16 |
| Chevrolet Master Conv. ..... 1936 | 6-3 1/16 x 4 | .006 | 9B..... | 3 1/4 B.. | .006H | .013H | A... | AC-K11.. | .032 | 5B..... | 1 3/4 B.. | .018 | Au.. | 5 | 15 | 112 | 2 1/16 | 1 1/32 | 3 ± 1/32 | 1 ± 1/32 | 1/16-1/8 | 7 1/16 ± 1 |

(Specifications continued on page 72)

APPROXIMATELY

# 1/2

# THE WEAR IN NEW ENGINES

The Research Department of The Institution of Automobile Engineers (London, England) has carried out a series of tests to compare the rate of wear in the cylinder of a new engine lubricated with plain oil and with oil containing "dag" colloidal graphite.

The total loss by wear, recorded by measurement on the piston rings, when oil containing colloidal graphite was used, was approximately 50% of that in the case of plain oil. The curves plotted for wear with plain oil and oil containing Acheson's colloidal graphite, "dag" Brand, showed a clear difference between the two lubricants, that for the latter being constantly about one half of the wear with plain oil.

It is very important to control wear in the new engine. Colloidal graphite does this while the engine is freeing itself. The working surfaces are also conditioned so that metal pick-up is reduced during running-in.

It has been mentioned that the conditions of the above tests accentuated the factors which give rise to wear in cold running. The tests were made to resemble road conditions where an engine stops and starts frequently, with much idling in between.

We will be glad to forward literature which gives more fully, the details surrounding the running of this test.

*Ask your oil supplier about his colloidal-graphited oils today*

ACHESON COLLOIDS CORPORATION
PORT HURON MICHIGAN

## Official Summary of Institution Report

*"A sample of running-in compound containing "Acheson's" colloidal graphite—"dag" Brand—was submitted on April 4th, 1935, for test purposes with respect to its effect on cylinder and piston ring wear in a new engine during the running-in period. Comparative tests were carried out on a plain oil and on oils containing proportions of running-in compound recommended by E. G. Acheson, Ltd. An unused cylinder barrel and unused piston ring were used in testing each lubricant and the test procedure involved repeated starts from cold, so that a certain amount of cylinder corrosion probably occured. The results show that during the running-in period the wear with oil containing colloidal graphite was approximately half that observed with plain oil."*

*For and on behalf of*
*The R. and S. Committee of the I. A. E.*
*(Signed)* C. G. WILLIAMS
DIRECTOR OF RESEARCH.

REG U.S. PAT. OFF.

**dag**

**COLLOIDAL PRODUCTS**

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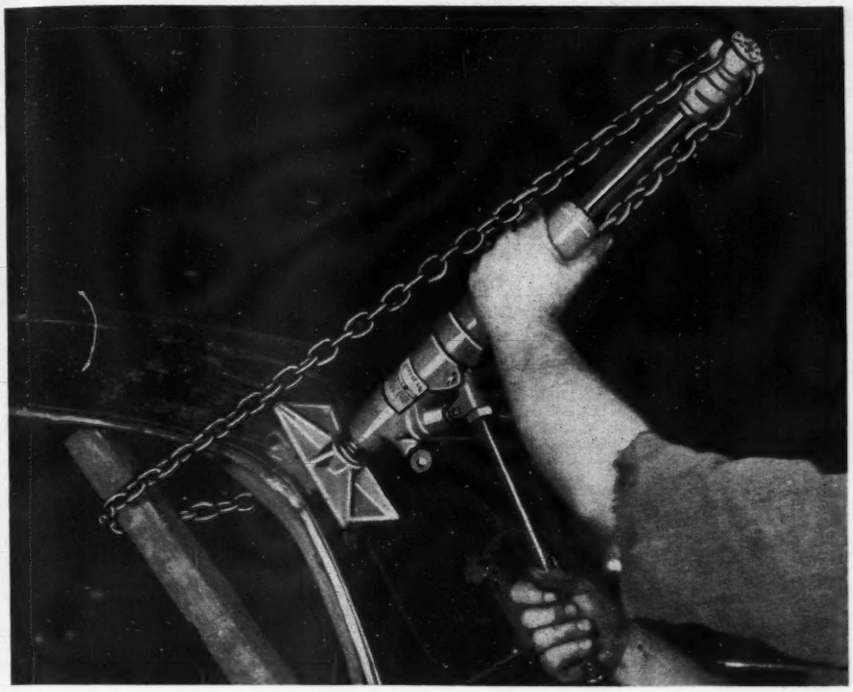
# COLLOIDAL GRAPHITE

"DAG" COLLOIDAL GRAPHITE IS A 100% AMERICAN MADE MATERIAL

# Tune Up Specifications—(1928 to 1937 Inclusive)

| MAKE AND MODEL | No. of Cylinders and Bore and Stroke | VALVES: Inlet Tappet Clearance for Valve Timing | VALVES: Intake Valve Opens Before or After T. C. — No. of Degrees (E—Exhaust Valve) | VALVES: Intake Valve Opens Before or After T. C. — No. of Flywheel Teeth (E—Exhaust Valve) | VALVES: Operating Tappet Clearance — Intake | VALVES: Operating Tappet Clearance — Exhaust | Rods Removed from | IGNITION: Spark Plug — Make and Model | IGNITION: Spark Plug — Gap | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — Spark Occurs °TC | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — No. of Flywheel Teeth Spark Occurs TC | IGNITION: Breaker Gap | IGNITION: Breaker Housing | Capacity Crank Case (Qts.) | Capacity Cooling System (Qts.) | Compression Pressure at Cranking Speed (Lbs.) (Standard Head) | CRANK-PIN: Diameter | CRANK-PIN: Length | FRONT AXLE: Caster (Degrees) | FRONT AXLE: Camber (Degrees) | FRONT AXLE: Toe-in (Inches) | FRONT AXLE: Kingpin Inclination (Degrees) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chevrolet Master Ind.....1936 | 6-3 3/16x4 | .006 | 9B..... | 3 1/4B.... | .006H | .013H | A... | AC-K11 | .032 | 5B..... | 1 3/4B... | .018 | Au.. | 5 | 15 | 112 | 2 1/8 | 1 1/2 | 0 | 1/4 | 1/16–1/8 | 7 3/4 |
| Chevrolet Standard.....1936 | 6-3 3/16x4 | .006 | 9B..... | 3 1/4B.... | .006H | .013H | A... | AC-K11 | .032 | 5B..... | 1 3/4B... | .018 | Au.. | 5 | 15 | 112 | 2 1/8 | 1 1/2 | 2 3/4 ± 1/2 | 1 ± 1/2 | 1/16–1/8 | 7 1/4 ± 1 |
| Chevrolet Master.....1937 | 6-3 1/2x3 3/4 | .006 | 9B..... | 3 1/4B.... | .006H | .013H | A... | AC-K11 | .040 | 5B..... | 1 3/4B... | .020 | Au.. | 5 | 14 | 112 | 2 1/16 | 1 1/8 | 2 3/4 ± 1/2 | 1 ± 1/2 | 1/16–1/8 | 7°–10° |
| Chevrolet Master DeLuxe...1937 | 6-3 1/2x3 3/4 | .006 | 9B..... | 3 1/4B.... | .006H | .013H | A... | AC-K11 | .040 | 5B..... | 1 3/4B... | .020 | Au.. | 5 | 14 | 112 | 2 1/16 | 1 1/16 | 0 | 1/4–3/4 | 1/16–1/32 | 7 3/4 |
| Chrysler 72.....1928 | 6-3 1/4x5 | .008 | 6A..... | 2A..... | .005H | .007H | A... | AC-A..... | .029 | 12 1/2B.. | 4B..... | .022 | A... | 6 | 15 | 78 | 2 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| Chrysler 80 Imperial.....1928-29 | 6-3 5/8x5 | .008 | ..... | 2A..... | .005H | .007H | A... | AC-G13.. | .025 | 9 1/2B.. | 3 1/4B | .022 | A... | 8 | 19 | 99 | 2 1/8 | 1 1/2 | 0–2E | 0–4 | 0–1/8 | 6 |
| Chrysler 65.....1928-29 | 6-3 1/16x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-A..... | .029 | 7 1/4B.. | 2B..... | .019 | A... | 6 | 13 | 80 | 1 7/8 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| Chrysler 75.....1928-29 | 6-3 1/4x5 | .008 | 6A..... | 2A..... | .005H | .007H | A... | AC-A..... | .025 | 12B..... | 4B..... | .022 | A... | 6 | 15 | 76 | 2 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| Chrysler CC-66.....1929-30 | 6-3 1/16x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-A..... | .027 | .020..... | 2 1/4B (f) | .020 | A... | 6 | 14 | 76 | 1 7/8 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| Chrysler CC-66.....1930 | 6-3 1/16x4 3/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-G11. | .027 | .035..... | 2 3/4B.. | .020 | A... | 6 | 14 | 76 | 1 7/8 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| Chrysler 77.....1929-30 | 6-3 5/8x5 | .011 | .017..... | ..... | .005H | .007H | A... | AC-G13. | .027 | 12B..... | 4B..... | .022 | A... | 6 | 21 | 76 | 2 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| [1]Chrysler 70.....1929-30-31 | 6-3 1/16x4 3/4 | .011 | 2A..... | ..... | .005H | .007H | A... | AC-G13. | .027 | .035..... | 2 3/4B.. | .022 | A... | 6 | 21 | 74 | 2 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| [2]Chrysler 70.....1929-30-31 | 6-3 5/8x5 | .011 | 2A..... | ..... | .005H | .007H | A... | AC-G13. | .027 | .067..... | 3 3/4B.. | .022 | A... | 6 | 21 | 74 | 2 | 1 3/8 | 0–2E | 0–4 | 0–1/8 | 7 |
| Chrysler L-Imperial.....1930 | 6-3 5/8x5 | .009 | 6A..... | 2A..... | .005H | .009H | A... | AC-G13. | .025 | .035B.. | 3 1/4B.. | .022 | A... | 8 | 21 | 99 | 2 1/8 | 1 1/2 | 1 1/2–2E | ..... | 1/8 | 7 |
| Chrysler CJ.....1930-31 | 6-3 1/16x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-G13. | .027 | 8 1/2B.. | 2 3/4B.. | .020 | Au. | 6 | 12 | ..... | 1 7/8 | 1 3/8 | 1 1/2–2E | 0–2 | 1/16–1/8 | 7 |
| Chrysler CD.....1930 | 8-3x4 1/4 | .011 | 4B..... | 1B-(g)... | .005H | .007H | AB | AG-G13. | .022 | ..... | 2 3/4B.. | .020 | Au. | 6 | 16 | 83 | 2 1/4 | 1 1/4 | 1 1/2–2E | 0–2 | 0–1/8 | 7 |
| Chrysler CD.....1931 | 8-3 1/16x4 1/4 | .011 | ..... | 2A..... | .005H | .007H | AB | AC-G13. | .022 | ..... | (h)..... | .020 | Au. | 6 | 16 | 83 | 2 1/4 | 1 1/4 | 1 1/2–2E | 0–2 | 0–1/8 | 7 |
| Chrysler CG-Imperial....1930-31 | 8-3 1/2x5 | .008 | 6A..... | 2A..... | .005H | .007H | A... | AC-G12. | .022 | 10B..... | 3 1/2B.. | .020 | A... | 8 1/2 | 26 | 76 | 2 1/8 | 1 3/8 | 1 1/2–2E | 0–2 | 0–1/8 | 7 |
| Chrysler CM.....1931 | 6-3 1/4x4 3/8 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-G12. | .022 | .034B.. | 3B..... | .020 | A... | 6 | 16 | 80 | 1 1/8 | 1 3/8 | 1 1/2–2E | 0–2 | 1/16–3/32 | 7 |
| Chrysler CD-DeLuxe.....1931 | 8-3 1/4x4 1/4 | .011 | 6A..... | 1 3/4A.... | .005H | .007H | A... | AC-K12. | .022 | .040B | 3 1/4B.. | .020 | Au.. | 6 | 19 | 80 | 2 1/4 | 1 1/4 | 1 1/2–2E | 0–2 | 0–1/8 | 7 |
| Chrysler CI.....1932 | 6-3 1/4x4 1/2 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-K12. | .028 | 10B..... | 3B..... | .020 | Au. | 6 | 16 | 84 | 1 1/8 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CP.....1932 | 8-3 1/4x4 1/2 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-K12. | .028 | 10B..... | 3B..... | .020 | A... | 6 | 19 | 80 | 2 1/8 | 1 1/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CH & CL-Imperial. 1932 | 8-3 1/2x5 | .008 | 6A..... | 2A..... | .005H | .007H | A... | AC-K12. | .028 | 11 1/2B.. | 4B..... | .020 | A... | 8 1/2 | 24 | 80 | 2 1/8 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CO.....1933 | 6-3 1/4x4 1/2 | .011 | 6A..... | 2 1/2A.... | .005H | .007H | A... | AC-K12. | .025 | TC..... | TC..... | .020 | Au. | 6 | 15 1/2 | 85 | 1 1/8 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CT-Royal.....1933 | 8-3 1/4x4 1/2 | .011 | 6A..... | 2 1/2A.... | .005H | .007H | A... | AC-K12. | .025 | 2B..... | 3/4B..... | .018 | A... | 6 | 19 1/2 | 80 | 2 1/8 | 1 1/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CQ-Imperial.....1933 | 8-3 1/4x4 1/2 | .011 | 6A..... | 2 1/2A.... | .005H | .007H | A... | AC-K12. | .025 | 10B..... | 4B..... | .018 | .p18 | Au. | 6 | 20 | 103 | 2 1/8 | 1 1/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CL-Imp. Cust... 1933-34 | 8-3 1/2x5 | .008 | 6A..... | 2A..... | .005H | .007H | A... | AC-K12. | .026 | 11 1/2B.. | 4B..... | .019 | A... | 8 1/2 | 28 | 95 | 2 1/8 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Chrysler CA & CB-Six.....1934 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .005H | .007H | A... | AC-S9.... | .025 | TC..... | TC..... | .020 | Au. | 6 | 15 1/2 | 87 | 2 1/8 | 1 1/8 | 1/2–2 1/2 | 1/4–3/4 | 1/16–1/8 | 8 1/2–10 1/2 |
| Chrysler CU-Airflow.....1934 | 8-3 1/4x4 1/2 | .011 | 2B..... | 1B..... | .005H | .007H | A... | AC-SL9.. | .025 | 6A..... | 1 1/2A.. | .018 | Au. | 6 | 23 | 110 | 2 1/8 | 1 1/8 | 1-3 | 1/4–3/4 | 1/16–1/8 | 9 |
| Chrysler CV-Imp. Airflow.... 1934 | 8-3 1/4x4 1/2 | .011 | 2B..... | 1B..... | .005H | .007H | A... | AC-SL9.. | .025 | 5A..... | 1 1/2A.. | .018 | Au. | 6 | 23 | 110 | 2 1/8 | 1 1/8 | 1-3 | 1/4–3/4 | 1/16–1/8 | 9 |
| Chrysler C6-Airstream.....1935 | 6-3 5/8x4 1/2 | .012 | 2B..... | 1B..... | .006H | .008H | A... | AC-KL-9 | .025 | TC..... | TC..... | .018 | Au. | 6 | 15 1/2 | 99 | 2 1/8 | 1 1/8 | 1/2–2 1/2 | 1/2N–1/2P | 1/16–1/8 | 8 1/2–10 1/2 |
| Chrysler CZ-Airstream.....1935 | 8-3 1/4x4 1/2 | .012 | 2B..... | 1B..... | .006H | .008H | A... | AC-K-9.. | .025 | TC..... | TC..... | .018 | Au. | 6 | 20 | 103 | 2 1/8 | 1 1/8 | 1/2–2 1/2 | 1/2N–1/2P | 1/16–1/8 | 4 1/2–5 1/2 |
| Chrysler C1-Airflow.....1935 | 8-3 1/4x4 7/8 | .012 | 2B..... | 1B..... | .006H | .008H | A... | AC-KL9.. | .025 | TC..... | TC..... | .018 | Au. | 6 | 19 | 103 | 2 1/8 | 1 1/8 | 2 | 1/4–3/4 | 1/16–1/8 | 4 |
| Chrysler C2-Imp. Airflow.... 1935 | 8-3 1/4x4 7/8 | .012 | 2B..... | 1B..... | .006H | .008H | A... | AC-KL9.. | .025 | TC..... | TC..... | .018 | Au. | 6 | 19 | 110 | 2 1/8 | 1 1/8 | 2 | 1/4–3/4 | 1/16–1/8 | 4 |
| Chrysler C3-Imp. Cust. Airfl. 1935 | 8-3 1/4x4 7/8 | .011 | 2B..... | 1B..... | .006H | .008H | A... | AC-KL9.. | .025 | 5A..... | 2A..... | .018 | Au. | 6 | 19 | 110 | 2 1/16 | 1 1/8 | 2 | 1/4–3/4 | 1/16–1/8 | 4 |
| Chrysler C7-Six.....1936 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .006H | .008H | A... | Ch-J8.... | .025 | TC..... | TC..... | .020 | Au. | 6 | 19 | 99 | 2 1/8 | 1 1/8 | 1 1/2 | 1/2N–1/2P | 0–1/8 | 9 3/4 |
| Chrysler C8-DeLuxe.....1936 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .008H | A... | Ch-J8.... | .025 | TC..... | TC..... | .018 | Au. | 6 | 22 | 103 | 2 1/8 | 1 1/8 | 1 1/2 | 1/2N–1/2P | 0–1/8 | 8 1/4 |
| Chrysler C9 & C10-Airfl. 8.. 1936 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .008H | A... | Ch-J8.... | .025 | TC..... | TC..... | .018 | Au. | 6 | 17 | 103 | 2 1/8 | 1 1/8 | 2 | 1/2 ± 1/4 | 0–1/8 | 5 |
| Chrysler C11-Airflow Imp. 8..1936 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .008H | A... | Ch-H10.. | .025 | 5A..... | 2A..... | .018 | Au. | 6 | 17 | 110 | 2 1/8 | 1 1/8 | 2 | 1/2 ± 1/4 | 0–1/8 | 5 |
| Chrysler Arf. Cust. Imp. 8... 1936 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .008H | A... | Ch-H10.. | .025 | 5A..... | 2A..... | .018 | Au. | 6 | 17 | 110 | 2 3/16 | 1 1/8 | 2 | 1/2 ± 1/4 | 0–1/8 | 5 |
| Chrysler Royal C16..... 1937 | 6-3 5/8x4 1/4 | .014 | TC..... | TC..... | .008H | .010H | A... | Ch-J8.... | .025 | 2A..... | 3/4A..... | .020 | Au. | 5 | 20 | 155† | 2 1/8 | 1 1/4 | 1 1/2 | 1/2N–1/2P | 0–1/8 | 4 3/4–6 |
| Chrysler Imperial C14..... 1937 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .010H | A... | Ch-H10.. | .025 | 3A..... | 1 1/4A.. | .018 | Au. | 6 | 22 | 155† | 2 3/16 | 1 1/2 | 1 1/2 | 1/2N–1/2P | 0–1/8 | 4 3/4–6 |
| Chrysler Custom Imperial C15 1937 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .010H | A... | Ch-H10.. | .025 | 5A..... | 2A..... | .018 | Au. | 6 | 21 | 150† | 2 1/16 | 1 1/8 | 2 | 1/2N–1/2P | 0–1/8 | 4 3/4–6 |
| Chrysler Airflow C17..... 1937 | 8-3 1/4x4 7/8 | .011 | 2B..... | 3/4B..... | .006H | .010H | A... | Ch-H10.. | .025 | 5A..... | 2A..... | .018 | Au. | 6 | 17 | 150† | 2 1/16 | 1 1/8 | 2 | 1/4–3/4 | 0–1/8 | 4 1/2–5 1/2 |
| Cord L-29.....1930-31 | 8-3 1/4x4 1/2 | .010 | 10A..... | 3A..... | .006H | .008H | B... | Ch-C7.... | .026 | 13B..... | 4B..... | .021 | A... | 8 | 22 | 82 | 2 1/8 | 1 1/2 | 1/2E | 1 1/2 | 0–1/8 | 1 1/4 |
| Cord.....1936-37 | 8-3 1/2x3 3/4 | .016 | 7 1/2B.... | 3 1/2B.... | .009 | .009 | A... | Ch-J9.... | .025 | 3 1/2B.. | 1 1/4B.. | .015 | Au. | 7 | 28 | 110 | 2 | 2 3/8 | 1–2 1/2 | 1 | 0 1/8 (0) | 6 |
| De Soto K.....1928-29-30 | 6-3x4 1/8 | .008 | 6A..... | 2A..... | .004H | .006H | A... | AC-G11. | .028 | .035B.. | ..... | .020 | A... | 6 | 10 | 76 | 1 1/16 | 1 1/4 | 1–2E | 2 | 1/8–1/4 | ... |
| De Soto CK.....1930 | 6-3 1/16x4 1/8 | .008 | 6A..... | 2A..... | .004H | .006H | A... | AC-G10. | .028 | 8B..... | 2 1/2B.. | .020 | A... | 6 | 10 | 80 | 1 1/16 | 1 1/4 | 1–2E | 2 | 1/8–1/4 | 7 |
| De Soto CF.....1930 | 8-2 7/8x4 | .011 | 4B..... | 1 1/4B.... | .005H | .007H | B... | AC-G10. | .022 | 10B..... | 3B..... | .022 | A... | 6 | 16 | 80 | 2 1/4 | 1 1/4 | 2E | 2 | 1/4–1/8 | 7 |
| De Soto CF.....1931 | 8-2 7/8x4 1/4 | .011 | 4B..... | 1 1/4B.... | .005H | .007H | B... | AC-G10. | .022 | 10B..... | 3B..... | .022 | A... | 6 | 16 | 80 | 2 1/4 | 1 1/4 | 1 1/2–2E | 2 | 1/8–1/4 | 7 |
| De Soto SA.....1931 | 6-3 1/4x4 1/8 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-G11. | .022 | .055B.. | ..... | .020 | Au. | 6 | 15 | 80 | 1 1/16 | 1 3/8 | 1 1/2–2E | 2 | 1/8–1/4 | 7 |
| De Soto SC.....1932 | 6-3 1/4x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-K12. | .028 | 9B..... | 2 3/4B.. | .020 | Au. | 6 | 14 1/2 | 84 | 1 1/16 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| De Soto SD.....1933 | 6-3 1/4x4 3/8 | .011 | 6A..... | 2 1/2A.... | .005H | .007H | A... | AC-K12. | .025 | (k) | (k) | .020 | Au. | 6 | 16 | 85 | 1 1/16 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| De Soto SE-Airflow.....1934 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .005H | .007H | A... | AC-SL9.. | ..... | 3A..... | ..... | .025 | Au. | 6 | 20 | 102 | 2 1/8 | 1 1/2 | 1-3 | 1/4–3/4 | 1/16–1/8 | 9 |
| De Soto SF-Airstream..... 1935 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .006H | .008H | A... | AC-K9... | .025 | 3A..... | ..... | .020 | Au. | 6 | 17 | 103 | 2 1/8 | 1 1/2 | 1/2–2 1/2 | 1/2N–1/2P | 1/16 | 9 |
| De Soto SG-Airflow..... 1935 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .006H | .008H | A... | AC-K9... | .025 | 3A..... | ..... | .020 | Au. | 6 | 17 | 103 | 2 1/8 | 1 1/2 | 1-3 | 1/4–3/4 | 0–1/8 | 4 |
| De Soto S1-Airstream..... 1936 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .006H | .008H | A... | Ch-J8.... | .025 | TC..... | TC..... | .020 | Au. | 6 | 19 | 99 | 2 1/8 | 1 1/2 | 1 1/2 | 1/2N–1/2P | 0–1/8 | 9 3/4 |
| De Soto S2-Airflow..... 1936 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .006H | .008H | A... | Ch-J8.... | .025 | 5A..... | 2A..... | .020 | Au. | 6 | 19 | 110 | 2 1/8 | 1 1/8 | 2 | 1/2 ± 1/4 | 0–1/4 | 5 |
| De Soto S3..... 1937 | 6-3 5/8x4 1/4 | .014 | TC..... | TC..... | .008H | .010H | A... | Ch-J8.... | .025 | 2A..... | 3/4R..... | .020 | Au. | 5 | 20 | 155† | 2 1/8 | 1 1/4 | 1 1/2 | 1/2N–1/2P | 0–1/8 | 4 3/4–6 |
| Dodge 128.....1928 | 4-3 7/16x4 1/2 | .005 | 3A..... | 1A..... | .004H | .005H | A... | AC-Z.... | .030 | 12B..... | 4B..... | .020 | A... | 6 | 12 1/2 | 45 | 1 5/8 | 1 7/8 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge Senior 6.....1928 | 6-3 1/4x4 1/2 | .010 | TC..... | TC..... | .005H | .005H | B... | AC-Z.... | .025 | 10B..... | 3B..... | .020 | A... | 7 | 18 | 88 | 2 3/8 | 1 1/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge Senior 6.....1928-29 | 6-3 5/8x4 1/2 | .010 | TC..... | TC..... | .005H | .005H | B... | AC-Z.... | .025 | 10B..... | 3B..... | .020 | A... | 7 | 18 | 88 | 2 3/4 | 2 3/4 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge Standard 6.....1928 | 6-3 5/8x3 7/8 | .007 | TC..... | TC..... | .005H | .005H | A... | AC-Z.... | .025 | 4B..... | 1B..... | .020 | A... | 6 | 13 | 78 | 2 1/8 | 1 11/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge Victory 6.....1928 | 6-3 5/8x3 7/8 | .007 | TC..... | TC..... | .005H | .005H | A... | AC-Z.... | .025 | 10B..... | 3B..... | .020 | A... | 6 | 14 | 78 | 2 1/8 | 1 11/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge DA.....1928 | 6-3 5/8x3 7/8 | .007 | TC..... | TC..... | .005H | 005H | A... | AC-I..... | .025 | 4B..... | 1 1/2B.. | .020 | A... | 6 | 14 | 78 | 2 1/8 | 1 11/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge DA.....1929 | 6-3 5/8x3 7/8 | .007 | TC..... | TC..... | .005H | .005H | A... | AC-G12. | .025 | 4B..... | 1 1/2B.. | .020 | A... | 6 | 14 | 78 | 2 1/8 | 1 11/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge DA.....1930 | 6-3 5/8x3 7/8 | .007 | TC..... | TC..... | .005H | .005H | A... | AC-G11. | .025 | 4B..... | 1 1/4B.. | .020 | A... | 6 | 14 | 78 | 2 1/8 | 1 11/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge DB-Senior.....1929-30 | 6-3 1/2x4 1/2 | .010 | TC..... | TC..... | .005H | .005H | B... | AC-G11. | .025 | 10B..... | 3B..... | .019 | A... | 7 | 18 | 88 | 2 3/8 | 1 11/16 | 2 2/3 L1 | 2 1/2 | 1/8 | 5 1/2 |
| Dodge DC.....1930-31 | 8-2 7/8x4 1/4 | .011 | 4B..... | 1 1/2B.... | .005H | .007H | B... | AC-G10. | .025 | 9 1/2B.. | 3B..... | .020 | A... | 6 | 12 | 80 | 1 1/16 | 1 1/4 | 1 1/2–2 L1 | 2 | 1/8–1/4 | 7 |
| Dodge DD.....1930-31 | 6-3 1/16x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-G11. | .028 | 8B..... | 2 1/4B.. | .020 | Au. | 6 | 14 | 86 | 1 1/16 | 1 3/8 | 1 1/2–2 L1 | 2 | 1/8–1/4 | 7 |
| Dodge DH.....1931 | 6-3 1/4x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-G11. | .022 | 7B..... | 2 1/4B.. | .020 | Au. | 6 | 16 | 86 | 1 1/16 | 1 3/8 | 1 1/2–2 L1 | 2 | 1/8–1/4 | 7 |
| Dodge DG.....1931 | 8-3x4 1/4 | .011 | 6A..... | 2A..... | .005H | .007H | B... | AC-G10. | .022 | 10B..... | 3 1/4B.. | .020 | Au. | 6 | 14 1/2 | 86 | 1 1/16 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Dodge DL.....1932 | 6-3 1/4x4 3/8 | .011 | 6A..... | 1 3/4A.... | .005H | .007H | A... | AC-S9.... | .028 | 10B..... | 3 1/4B.. | .020 | Au. | 5 | 18 | 80 | 2 1/16 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Dodge DK.....1932 | 8-3 1/4x4 1/4 | .011 | 6A..... | 1 3/4A.... | .005H | .007H | A... | AC-S9.... | .028 | (m)..... | (m)..... | .020 | Au. | 6 | 14 1/2 | 88 1/2 | 1 1/16 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/8 | 9 |
| Dodge DP.....1933 | 6-3 1/16x4 3/8 | .011 | 6A..... | 2 1/2A.... | .005H | .007H | A... | AC-S9.... | .025 | 10B..... | 4B..... | .018 | Au. | 6 | 18 1/2 | 80 | 2 1/16 | 1 3/8 | 1-3 | 1/4–3/4 | 0–1/4 | 7 |
| Dodge DO.....1933 | 8-3 1/4x4 1/4 | .011 | 6A..... | 2 1/2A.... | .005H | .007H | A... | AC-S9.... | .025 | 2A..... | 3/4A..... | .020 | Au. | 6 | 18 1/2 | 91 | 2 1/16 | 1 | 1-3 | 1 N–1 P | 0–1/8 | 8 1/2–10 1/2 |
| Dodge DR & DS.....1934 | 6-3 1/4x4 3/8 | .011 | 6A..... | 2A..... | .005H | .007H | A... | AC-S9.... | .025 | 4A..... | 1 1/2A.. | .020 | Au. | 5 | 17 | 110 | 2 1/16 | 1 | 1-3 | 1/4–3/4 | 0–1/8 | 8 1/2 |
| Dodge DU.....1935 | 6-3 1/4x4 3/8 | .011 | 6A..... | 2 1/2A.... | .006 | .008 | A... | AC-K9.... | .025 | 4A..... | 1 1/2A.. | .020 | Au. | 5 | 15 | 110 | 2 1/16 | 1 | 2 | 1/2 ± 1/4 | 0–1/4 | 9 1/4 |
| Dodge.....1936-37 | 6-3 1/4x4 3/8 | .011 | 6A..... | 2 1/2A.... | .006H | .008H | A... | Ch-J8.... | .025 | 4A..... | 1 1/2A.. | .020 | Au. | 5 | 16 | 140† | 2 1/16 | 1 | 2 | 1/4–3/4 | 0–1/8 | 4 1/2–5 1/2 |
| Erskine 52.....1929-30 | 6-2 3/4x4 1/2 | .010 | 5A..... | 1 1/2A.... | .008H | .008H | B... | Ch-C4.... | .025 | TC..... | TC..... | .019 | 1/2A. | 5 | 13 | 80 | 2 | 1 1/2 | 1 1/2–2E | 2 | 1/16–1/8 | 6 |
| Essex Challenger.....1929 | 6-2 3/4x4 1/2 | .004 | 10 1/2B.. | 3 1/4B.... | .004H | .006H | B... | AC-G10. | .028 | TC..... | TC..... | .020 | Au. | 6 | 19 | 95 | 1 1/16 | 1 3/8 | 1-E | 1 | 0–1/8 | 7 |
| Essex Challenger.....1930 | 6-2 3/4x4 1/2 | .004 | 10 1/2B.. | 3 1/4B.... | .004H | .006H | B... | AC-G10. | .022 | TC..... | TC..... | .020 | Au. | 5 | 19 | 95 | 1 1/16 | 1 3/8 | 1-E | 1 | 0–1/8 | 7 |
| Essex Challenger.....1931 | 6-2 7/16x4 1/2 | .004 | 10 1/2B.. | 3 1/4B.... | .004H | .006H | B... | AC-G10. | .022 | TC..... | TC..... | .020 | Au. | 5 | 18 1/2 | 95 | 1 1/16 | 1 3/8 | 1-E | 1 | 0–1/8 | 7 |
| Essex Greater Super.....1932 | 6-2 11/16x4 3/4 | .010 | 11B..... | 3B..... | .004H | .006H | B... | AC-G8... | .022 | TC..... | TC..... | .020 | Au. | 6 | 18 1/2 | 88 1/2 | 1 1/16 | 1 3/8 | 1-E | 1 | 0–1/8 | 7 |
| Ford A.....1928-29 | 4-3 7/16x4 1/4 | .011 | 7B..... | 2B..... | .011C | .016C | A... | Ch-3x.... | .025 | TC..... | TC..... | .020 | Re.. | 5 | 12 | 67 1/2 | 1 1/2 | 1 5/8 | 5-E | 2 | 1/2–3/4 | 7 |
| Ford A.....1930-31 | 4-3 7/16x4 1/4 | .011 | 7 1/2B.... | 2B..... | .011C | .016C | A... | Ch-3x.... | .025 | TC..... | TC..... | .020 | Re.. | 5 | 12 | 61 | 1 1/2 | 1 5/8 | 5-E | 2 | 1/2–3/4 | 7 |
| Ford B.....1932 | 4-3 7/16x4 1/4 | .011 | 7 1/2B.... | 2B..... | .011C | .021C | A... | Ch-C4.... | .030 | TC..... | TC..... | .020 | Au.. | 5 | 12 | 68 | ..... | ..... | 8 3/4 L | 2 | 1/4 | 7 |
| Ford V8.....1932 | 8-3 1/16x3 3/4 | .013 | 9 1/2B.... | 3B..... | .013C | .013C | A... | Ch-C4.... | .025 | 4B..... | ..... | .013 | A... | 5 | 22 | 88 1/2 | 2 | 1 3/4 | 8 3/4 L | 2 | 1/4 | 7 |
| Ford 40-V8.....1933-34 | 8-3 1/16x3 3/4 | .013 | 9 1/2B.... | 3B..... | .013C | 013C | A... | Ch-7..... | .025 | 4B..... | 1 1/2B.. | .013 | A... | 5 | 22 | 105 | 2 3/16 | 1 3/4 | 8 3/4 L | 2 | 1/4 | 7 |
| Ford 48-V8.....1925 | 8-3 1/16x3 3/4 | .013 | 9 1/2B.... | 3B..... | .013C | .013C | A... | Ch-C7.... | .025 | 4B..... | 1 1/2B.. | .013 | A... | 5 | 22 | 105 | 2 | 1 1/2 | 7 | 2 | 1/4 | ..... |
| Ford V8.....1936 | 8-3 1/16x3 3/4 | .013 | 9 1/2B.... | 3B..... | .013C | .013C | A... | Ch-C7.... | .025 | 4B..... | 1 1/2B.. | .013 | Au.. | 5 | 22 | 105 | 2 | 1 1/16 | 7 | 3/4 | 1/16–1/8 | 8 1/4 |

(Specifications continued on page 74)



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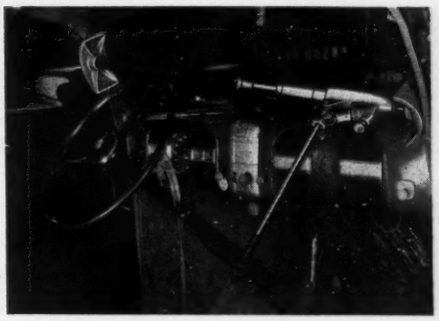
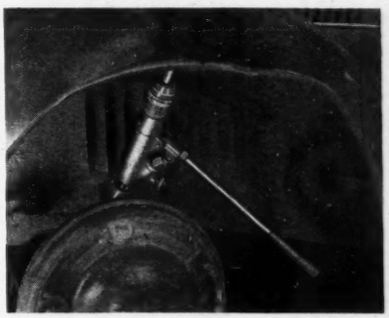
**Straightens — Presses — Bends — Pushes — Pulls. And saves money on every operation.**

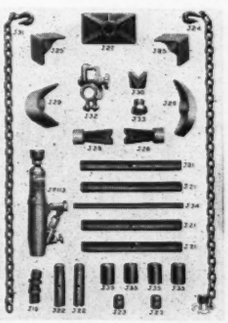


Spreading windshield opening window, door frames, etc.

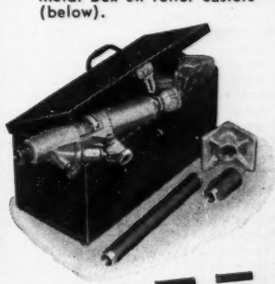


Provides any angle thrust for straightening damaged fenders.

Showing chain hook-up and use of Fender-Clamp to pull damaged fender downward and outward.



27 Pieces (shown left) pack conveniently in this strong metal box on roller casters (below).



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112 Second St., Milwaukee, Wis.

Please send Hydrau-Kit catalog showing wide variety of body and fender jobs outfit handles quickly and at low cost.

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# Tune Up Specifications—(1928 to 1937 Inclusive)—Continued

| MAKE AND MODEL | No. of Cylinders and Bore and Stroke | VALVES: Inlet Tappet Clearance for Valve Timing | VALVES: Intake Valve Opens Before or After T. C. — No. of Degrees (E=Exhaust Valve) | VALVES: Intake Valve Opens Before or After T. C. — No. of Flywheel Teeth (E=Exhaust Valve) | VALVES: Operating Tappet Clearance — Intake | VALVES: Operating Tappet Clearance — Exhaust | Rods Removed from | IGNITION: Spark Plug — Make and Model | IGNITION: Spark Plug — Gap | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — Spark Occurs °TC | IGNITION: Timing — No. of Flywheel Teeth Spark Occurs TC | IGNITION: Timing — Breaker Gap | IGNITION: Timing — Breaker Housing | Capacity Crank Case (Qts.) | Capacity Cooling System (Qts.) | Compression Pressure at Cranking Speed (Lbs.) (Standard Head) | CRANK-PIN: Diameter | CRANK-PIN: Length | FRONT AXLE: Caster (Degrees) | FRONT AXLE: Camber (Degrees) | FRONT AXLE: Toe-in (Inches) | FRONT AXLE: Kingpin Inclination (Degrees) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ford V8-60 1937 | 8-2.6x3.2 | .013 | 9½B | | .013C | .013C | | Ch-H10 | .025 | 4B | | .015 | Au. | 4 | 15.2 | 150‡ | 1.60 | 1.54 | 8 | 1 | 1/16–1/8 | 8 |
| Ford V8-85 1937 | 8-3 1/16x3¾ | .013 | 9½B | 3B | .013C | .013C | A | Ch-7 | .025 | 4B | 1¼B | .015 | Au. | 5 | 22 | 100 | 2 | 1 1/16 | 8 | 1 | 1/16–1/8 | 8 |
| Franklin 130 1929 | 6-3¼x4¾ | .031 | TC | TC | .012C | .012C | RC | Ch-C7 | .025 | 13B | 3½B | .020 | A | 6 | Ac | 63½ | 2⅛ | 1¾ | 1-E | 2 | 0–⅛ | 7 |
| Franklin 135-137 1929 | 6-3¼x4¾ | .031 | TC | TC | .012C | .012C | RC | Ch-C7 | .025 | 13B | 2¾B | .020 | A | 6 | Ac | 70 | 2⅛ | 1 1/16 | 1-E | 2 | 0–⅛ | 7 |
| Franklin 145-147 1930 | 6-3¼x4¾ | .036 | 12A | 3½ | .007H | .007H | RC | Ch-C7 | .025 | 8B | 2¼B | .020 | A | 6 | Ac | 84 | 2⅛ | 1⅞ | 1-E | 2 | 0–⅛ | 7 |
| Franklin 1931 | 6-3¼x4¾ | .031 | 28A | 10A | .007H | .007H | RC | Ch-C7 | .025 | 6B | 2B | .020 | A | 6 | Ac | 84 | 2⅛ | 1⅞ | 1-E | 2 | 0–⅛ | 7 |
| Franklin 1932, 33 | 6-3½x4¾ | .036 | 28A | 9¾A | .007H | .007H | RC | Ch-C7 | .025 | 6B | 2B | .020 | A | 6 | Ac | 78 | 2⅛ | 1⅞ | ½-1E | 2 | 0–⅛ | 7 |
| Graham 46-Standard 1930-31 | 6-3½x4½ | .010C | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 1B | ⅛B | .020 | A | 6 | 20 | 86½ | 2¼ | 1¾ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Graham 45-Special 1930-31 | 6-3¼x4½ | .010C | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 1B | ⅛B | .020 | A | 6 | 20 | 88 | 2¼ | 1¾ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Graham 822-Standard 1930-31 | 8-3¼x4½ | .010C | TC | TC | .010H | .010H | B | Ch-C7 | .025 | 5B | 1½B | .020 | A | 8 | 20 | 80 | 2⅛ | 1¾ | 1½–2½E | 1½ | ⅛–⅜ | 7 |
| Graham Custom 8 1930 | 8-3⅛x4½ | .012 | 2A | 2⅝A | .010H | .010H | B | Ch-C7 | .023 | 4B | 1¼B | .020 | A | 8 | 26 | 86½ | 2⅜ | 1½ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Graham Custom 8 1931 | 8-3⅛x4½ | .012 | 2A | 2⅝A | .010H | .010H | B | Ch-C7 | .023 | 4B | 1¼B | .020 | A | 8 | 27 | 80 | 2¼ | 1¾ | 1½–2½E | 1½ | ⅛–⅜ | 7 |
| Gra'm 42-822 & 42-834 1930-31-32 | 8-3¼x4½ | .010C | TC | TC | .010H | .010H | B | Ch-C7 | .025 | 5B | 1¾B | .020 | A | 8 | 27 | 87 | 2¼ | 1¾ | 1½–2½E | 1½ | ⅛–⅜ | 7 |
| Graham 53-Standard 1931-32 | 6-3¼x4½ | .010C | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 1B | ⅛B | .020 | A | 6 | 20 | 89 | 2¼ | 1¾ | 1½–2½E | 1½ | ⅛–⅜ | 9 |
| Graham 54-Special 1931-32 | 6-3¼x4½ | .010C | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 1B | ⅛B | .020 | A | 6 | 20 | 89 | 2¼ | 1¾ | 1½–2½E | 1½ | ⅛–⅜ | 9 |
| Graham 820-Special 1931-32 | 8-3⅛x4 | .012 | TC | TC | .010H | .010H | B | Ch-C7 | .025 | 6B | 1¾B | .020 | A | 6 | 20 | 89 | 2⅛ | 1¾ | | | | |
| Graham Pros. 6-Gr. 6 1931-32-33 | 6-3⅛x4½ | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 1B | ⅛B | .020 | Au | 6 | 20 | 86½ | 2¼ | 1¾ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Graham 58 1932 | 6-3¼x4½ | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 3B | 1B | .018 | A | 6 | 20 | 88 | 2¼ | 1¾ | 1½–2½ | 1½ | ⅛–⅜ | 9 |
| Graham 57-Bl Std. 1932-33 | 8-3½x4 | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 6B | 1¾B | .020 | A | 6 | 20 | 109½ | 2⅛ | 1¾ | 1½–2½ | 1½ | ⅛–⅜ | 7 |
| Graham 65-Standard 1933 | 6-3¼x4½ | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 3B | 1¼V | .019 | Au. | 6 | 20 | 109½ | 2¼ | 1¾ | 1½–2½ | 1½ | ⅛–⅜ | 7 |
| Graham 64-Standard 1933 | 8-3¼x4 | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 3B | 1¼B | .019 | Au. | 6 | 20 | 109½ | 2¼ | 1¾ | 1½–2½ | 1½ | ⅛–⅜ | 7 |
| Graham 57A-Custom 1933 | 8-3½x4 | .012 | TC | TC | .010H | .010H | B | Ch-C7 | .025 | 3B | 1¼B | .018 | A | 6 | 20 | 109½ | 2¼ | 1¾ | 1½–2½ | 1½ | ⅛–⅜ | 7 |
| Graham 68 1934 | 6-3¼x4½ | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 3B | 1B | .018 | A | 6 | 20 | 109 | 2¼ | 1¾ | 1½–2½ | 1–2 | ⅛ | 7–7½ |
| Graham Standard & Spec. 1934 | 8-3½x4 | .012 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | 3B | 1B | .018 | Au. | 6 | 20 | 109½ | 2⅛ | 1¾ | 1½–2½ | 1–2 | ⅛ | 7–7½ |
| Graham 69 1934 | 8-3½x4 | .012 | TC | TC | .010H | .010H | B | Ch-7 | .025 | 3B | 1B | .015 | Au. | 6 | 20 | 113 | 2⅛ | 1¾ | 1½–2½ | 1–2 | ⅛ | 7–7½ |
| Graham 74-Standard 1935 | 6-3x4 | .012 | 2B | 1B | .010H | .010H | A | Ch-C7 | .025 | 2B | 1B | .018 | Au. | 5 | 15 | 95 | 1⅛ | 1⅛ | 1½–2½ | 1–2 | ⅛ | 7–7½ |
| Graham 73-Special 1935 | 6-3¼x4½ | .012 | 2B | ¾B | .010H | .010H | B | Ch-C7 | .025 | 3B | 1½B | .018 | Au. | 6 | 17½ | 105 | 2¼ | 1¼ | 1½–2½ | 1–2 | ⅛ | 7–7½ |
| Graham 72-75 1935 | 8-3½x4 | .012 | TC | TC | .010H | .010H | B | Ch-C7 | .025 | 3B | 1B | .018 | Au. | 7 | 18 | 115 | 2⅛ | 1¼ | 1½–2½ | 1–2 | ⅛ | 7–7½ |
| Graham Crusader 80, 80A 1936 | 6-3x4 | .012 | 4½B | 1½B | .010H | .010H | A | Ch-C7 | .025 | 2B | ¾B | .018 | Au. | 5 | 11 | 115 | 1⅛ | 1⅛ | 2½ | ¾ | ⅛ | 7½ |
| Graham Cavalier 90, 90A 1936 | 6-3¼x4½ | .012 | 4½B | 1½B | .010H | .010H | A | Ch-J9 | .025 | 2B | ¾B | .018 | Au. | 5 | 15½ | 114 | 1⅛ | 1⅛ | 2½ | ¾ | ⅛ | 7½ |
| Graham Sup. Ch. 6-110 1936 | 6-3¼x4½ | .012 | 4½B | 1½B | .010H | .010H | A | Ch-J9 | .025 | 2B | ¾B | .018 | Au. | 5 | 18½ | 114 | 1⅛ | 1⅛ | 2½ | ¾ | ⅛ | 7½ |
| Graham 85 1937 | 6-3x4 | .012 | 4½B | 1½B | .010H | .010H | A | Ch-7 | .025 | 2B | ¾B | .018 | A | 5 | 11 | 115 | 1⅛ | 1⅛ | 4½–5½ | 1 | 1/16–⅛ | 7½ |
| Graham 95 1937 | 6-3½x4 | .012 | 2A | ¾A | .010H | .010H | A | Ch-J9 | .025 | TC | TC | .018 | A | 5 | 15 | 120 | 2 1/16 | 1⅛ | 4–4½ | 1 | 1/16–⅛ | 7½ |
| Graham S. C. 116 1937 | 6-3¼x4 | .012 | 4½B | 1½B | .010H | .010H | A | Ch-J9 | .025 | 4A | 1½A | .018 | A | 5 | 15 | 120 | 2 1/16 | 1⅛ | 3–4 | 1 | 1/16–⅛ | 7½ |
| Graham S. C. 120 1937 | 6-3¼x4⅜ | .012 | 4½B | 1½B | .010H | .010H | A | Ch-J9 | .025 | 4A | 1½A | .018 | A | 5 | 15 | 120 | 2 1/16 | 1⅛ | 3–4 | 1 | 1/16–⅛ | 7½ |
| Graham-Paige 835 1928-29 | 8-3⅛x4½ | .010C | 2A | ½A | .008H | .008H | B | Ch-C7 | .025 | 4B | 1½B | .018 | A | 8 | 27 | 89½ | 2¼ | 1½ | 4E | 1 | ⅛–⅜ | 9 |
| Graham-Paige 615 1929 | 6-3¼x4½ | .010 | TC | TC | .006H | .010H | B | Ch-C4 | .025 | 1B | | .019 | A | 6 | 20 | 88.6 | 2¼ | 1¼ | 1½–2½ | 1½ | ⅛–⅜ | 7 |
| Graham-Paige 612 1929 | 6-3¼x4½ | .010 | TC | TC | (n) | .010H | B | Ch-C4 | .025 | SPF* | SPF* | .019 | A | 6 | 22½ | 90 | 2¼ | 1¼ | 2E | 1½ | ⅛–⅜ | 7 |
| Graham-Paige 612 1930 | 6-3¼x4½ | .010 | TC | TC | (n) | .010H | B | Ch-C4 | .025 | SPF* | SPF* | .019 | A | 6 | 22½ | 90 | 2¼ | 1¼ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Graham-Paige 621 1929-30 | 6-3½x5 | .010 | TC | TC | .010H | .010H | B | Ch-C4 | .025 | SPF* | SPF* | .020 | A | 7 | 25 | 85 | 2¼ | 1½ | 2E | 1 | ⅛–⅜ | 9 |
| Graham-Paige 827 1929 | 8-3⅛x4½ | .012 | 2A | 2⅝A | (p) | (n) | B | Ch-C7 | .025 | 4B | 1¼B | .018 | A | 8 | 27 | 89 | 2⅜ | 1½ | 2E | 1 | ⅛–⅜ | 9 |
| Graham-Paige 837 1929 | 8-3⅛x4½ | .012 | 2A | 2⅝A | (p) | (p) | B | Ch-C7 | .025 | 4B | 1¼B | .018 | A | 8 | 18½ | 89 | 2¼ | 1½ | 2E | 1 | ⅛–⅜ | 9 |
| Graham-Paige 827 1930 | 8-3⅛x4½ | .012 | 2A | 2⅝A | (p) | (p) | B | Ch-C7 | .025 | 4B | 1¼B | .018 | A | 8 | 27 | 89 | 2⅜ | 1½ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Graham-Paige 837 1930 | 8-3⅛x4½ | .012 | 2A | 2⅝A | (p) | (p) | B | Ch-C7 | .025 | 4B | 1¼B | .018 | A | 8 | 18½ | 89 | 2⅜ | 1½ | 1½–2½E | 1 | ⅛–⅜ | 9 |
| Hudson Greater 6 1929 | 6-3½x5 | | | | .005H | .007H | (r) | AC-G10 | .022 | 10B | 3B | .020 | A | 7 | | 99 | 2¼ | 2 | 1E | 2½ | 0–⅛ | 6½ |
| Hudson Greater 8 1930 | 8-2⅞x4½ | .004 | 10½B | 3¼B | .004H | .006H | B | AC-G10 | .023 | TC | TC | .020 | Au. | 8 | 18 | 95 | 1⅛ | 1⅜ | 1E | 1 | 0–⅛ | 7 |
| Hudson Greater 8 1931 | 8-2⅞x4½ | .004 | 10½B | 3¼B | .004H | .006H | B | AC-G10 | .023 | TC | TC | .020 | Au. | 8 | 17 | 95 | 1⅛ | 1⅜ | 1E | 1 | 0–⅛ | 7 |
| Hudson Greater 8 1932 | 8-3x4½ | .010 | 10½B | 3B | .004H | .006H | B | AC-G8 | .022 | TC | TC | .020 | Au. | 9½ | 17 | 95 | 1⅛ | 1⅜ | 1E | 1 | 0–⅛ | 7 |
| Hudson E-Super 6 1933 | 6-2⅛x4¾ | .006 | 11B | 3¼B | .006H | .008H | B | AC-K9 | .022 | TC | TC | .020 | Au. | 6½ | 14½ | 103 | 1⅛ | 1⅜ | 4E | 1 | 0–⅛ | 7 |
| Hudson T-Std. & L-Maj. 8 1933 | 8-3x4½ | .006 | 11B | 3¼B | .006H | .008H | B | AC-G8 | .020 | TC | TC | .020 | Au. | 8 | 17 | 95 | 1⅛ | 1⅜ | 4E | 1 | 0–⅛ | 7 |
| Hudson LT & LTS 1934 | 8-3x4½ | .010 | 10½B | 4B | .006H | .008H | A | Ch-J7 | .022 | TC | TC | .020 | Au. | 7 | 23 | 93 | 1⅛ | 1⅜ | 2½–3½E | 2 | 0–⅛ | 7 |
| Hudson LL 1934 | 8-3x4½ | .010 | 10½B | 4B | .006H | .008H | A | Ch-J7 | .022 | TC | TC | .020 | Au. | 7 | 23 | 93 | 1⅛ | 1⅜ | 2½–3½E | 2 | 0–⅛ | 7 |
| Hudson GH 1935 | 6-3x4½ | .010 | 10½B | 4B | .006H | .008H | A | Ch-J7 | .025 | TC | TC | .020 | Au. | 6 | 16 | 103 | 1⅛ | 1⅜ | 3½–3¾ | | 0–⅛ | 7 |
| Hudson HT-HU-HHU 1935 | 8-3x4½ | .010 | 10½B | 4B | .006H | .008H | BA | Ch-J7 | .020 | TC | TC | .020 | Au. | 7 | 18 | 104 | 1⅛ | 1⅜ | 4–4½ | | 0–⅛ | 7 |
| Hudson 6-63 1936 | 6-3x5 | .010 | 10½B | 4B | .006H | .008H | A | Ch-J8 | .022 | TC | TC | .020 | Au. | 5 | 13 | 103 | 1⅛ | 1⅜ | 3½–4½ | 1–1½ | 0–⅛ | 7 |
| Hudson 8-64, 5, 6, 7 1936 | 8-3x4½ | .010 | 10½B | 4B | .006H | .008H | BA | Ch-J8 | .022 | TC | TC | .020 | Au. | 7 | 20 | 99 | 1⅛ | 1⅜ | 3½–4½ | 1–1½ | 0–⅛ | 7 |
| Hudson 6-73 1937 | 6-3x5 | .006H | 10½B | 4B | .008 | .010 | A | Ch-J8 | .022 | TC | TC | .020 | Au. | 5 | 13 | 117 | 1⅛ | 1⅜ | 0–½ | 1–1½ | 0–⅛ | 7 |
| Hudson 8-74, 5, 6, 7 1937 | 8-3x4½ | .006H | 10½B | 4B | .008 | .010 | A | Ch-H10 | .022 | TC | TC | .020 | Au. | 7 | 20 | 118 | 1⅛ | 1⅜ | | 1–1½ | 0–⅛ | 7 |
| Hup. C-Cent & C-221. 1930-31-32 | 8-3x4¾ | .010 | 1B | ⅛B | .007C | .014C | B | Ch-C7 | .027 | 9B | 3B | .020 | A | 9 | 20 | 80 | 2⅜ | 1 1/16 | 3L§ | 1 | 1/32–1/16 | 7¼ |
| Hup. H, U. 225 & 237. 1930-31-32 | 8-3½x4¾ | .010 | 1A | ⅛A | .007C | .014C | A | Ch-C7 | .027 | 9B | 3B | .020 | A | 12 | 28 | 80 | 2⅜ | 1½ | 3L§ | 1 | 1/32–1/16 | 7¼ |
| Hupmobile Cent 1930, 31 | 6-3¼x4¼ | .010 | 4A | 1A | .008C | .008C | B | Ch-C7 | .026 | TC | TC | .016 | Re. | 6 | 14 | 76 | 2⅛ | 1 1/16 | 1½–2½L§ | 1 | 0–⅛ | 7½ |
| Hupmobile S-214 1932 | 6-3¼x4¼ | .010 | 4A | 1A | .008C | .008C | B | Ch-C7 | .026 | TC | TC | .016 | Re. | 6 | 14 | 76 | 2⅛ | 1 1/16 | 1½–2½L§ | 1 | 0–⅛ | 7½ |
| Hupmobile L 1931, 32 | 8-2⅞x4⅝ | .010 | 1A | ⅛A | (m) | (m) | B | Ch-C7 | .027 | 20B | 6B | .020 | A | 6 | 16 | 80 | 2¼ | 1⅜ | 1-2L§ | 1 | 0–⅛ | 7½ |
| Hupmobile B-216 & B-316 1932-33 | 6-3⅛x4¼ | .010 | 4A | 1–1½A | .006C | .008C | AB | Ch-C7 | .029 | 10B | 3¼B | .016 | A | 6 | 13 | 76 | 2⅛ | 1¼ | 1-2L | 1 | 0–⅛ | 7½ |
| Hupmobile F-222-2nd Series 1932 | 8-2 1/16x4⅝ | .020 | TC | TC | .018C | .018C | B | Ch-C7 | .029 | 13B | 4B | .021 | A | 6 | 21 | 87 | 2¼ | 1.14 | 1½–2½L | 1¾ | 0–⅛ | 8 |
| Hupmobile F-222-2nd Series 1932 | 8-3x4⅝ | .020 | TC | TC | .018C | .018C | B | Ch-C7 | .029 | 13B | 4B | .021 | A | 6 | 21 | 87 | 2¼ | 1.14 | 1½–2½L | 1¾ | 0–⅛ | 8 |
| Hupmobile I-226-2nd Series 1932 | 8-3 1/16x4¾ | .010 | 7-10A | 2-3A | .007C | .015C | B | Ch-C7 | .029 | 9B | 2¾B | .021 | A | 9 | 24 | 89 | 2⅜ | 1¼ | 1½–2½L | 1¾ | 0–⅛ | 8 |
| Hupmobile K-321-KK-321A. 1933 | 6-3⅛x4¼ | .014 | 2B | ¾B | .010H | .013H | A | Ch-C7 | .029 | 10B | 3¼B | .016 | A | 6 | 16 | 76 | 2⅛ | 1¼ | 1-2L | 1¼ | 0–⅛ | 8½ |
| Hupmobile F-322 1933 | 8-3x4⅝ | .020 | TC | TC | .018H | .018H | B | Ch-C7 | .027 | 9B | 2¾B | .021 | A | 6 | 24 | 89 | 2¼ | 1½ | 1-2L | 1¼ | 0–⅛ | 8½ |
| Hupmobile I 326 1933 | 8-3 1/16x4¾ | .020 | 3A | 1A | .018H | .018H | B | Ch-C7 | .029 | 9B | 2¾B | .021 | A | 9 | 24 | 83 | 2⅜ | 1¼ | 1-2L | 1¼ | 0–⅛ | 8½ |
| Hupmobile 417W 1934 | 6-3½x3⅞ | .014 | 2B | 1B | .010C | .013C | A | Ch-C7 | .028 | 7B | 2B | .016 | A | 6 | 16 | 84 | 2⅛ | 1¼ | 1-2L | 1¼ | 0–⅛ | 8½ |
| Hupmobile 421J 1934 | 6-3⅛x4¼ | .014 | 2B | 1B | .010C | .013C | A | Ch-C7 | .028 | 7B | 2½B | .016 | A | 6 | 16 | 93 | 2⅛ | 1¼ | 1-2L | 1¼ | 0–⅛ | 8½ |
| Hupmobile 427T 1934 | 8-3 1/16x4¾ | .020 | 3A | 1A | .020C | .020C | B | Ch-C7 | .029 | 9B | 2¾B | .021 | A | 8 | 24 | 95 | 2⅛ | 1¼ | 1-2L | 1¼ | 0–⅛ | 8½ |
| Hupmobile 518D 1935 | 6-3⅛x4¼ | .014 | 2B | ⅛B | .010C | .013C | A | Ch-C7 | .028 | 7B | 2B | .016 | A | 6 | 20 | 110 | 2⅛ | 1¼ | 1½ | 1¼ | 1/16–⅛ | 7½ |
| Hupmobile 521O 1935 | 8-3 1/16x4¾ | .020 | 3A | 1A | .020C | .020C | B | Ch-C7 | .029 | 9B | 2¾B | .021 | A | 8 | 24 | 95 | 2⅛ | 1¼ | 1½ | 1¼ | 1/16 ± 1/16 | 8½ |
| Hupmobile 517W 1935 | 6-3½x3⅞ | .014 | 2B | 1B | .010C | .013C | A | Ch-C7 | .028 | 7B | 2B | .016 | A | 6 | 16 | 84 | 2⅛ | 1¼ | 1½ | 1¼ | 0–⅛ | 8½ |
| Hupmobile 521J 1935 | 6-3⅛x4¼ | .014 | 2B | 1B | .010C | .013C | A | Ch-C7 | .028 | 7B | 2½B | .016 | A | 6 | 16 | 93 | 2⅛ | 1¼ | 1½ | 1¼ | 0–⅛ | 8½ |
| Hupmobile 527T 1935 | 8-3 1/16x4¾ | .020 | 3A | 1A | .020C | .020C | B | Ch-C7 | .029 | 9B | 2¾B | .021 | A | 8 | 24 | 95 | 2⅜ | 1¼ | 1½ | 1¼ | 0–⅛ | 8½ |
| Hupmobile 618G 1936 | 6-3⅛x4¼ | .014 | 2B | ⅛B | .010 | .013 | A | Ch-C7 | .028 | 7B | 2¼B | .018 | A | 6 | 18 | 107 | 2⅛ | 1¼ | 1½ | 1 | 1/16–⅛ | 7½ |
| Hupmobile 621N 1936 | 6-3 1/16x4¾ | .010 | 1A | ¼A | .006 | .013 | B | Ch-C7 | .028 | 7B | 2¼B | .016 | A | 8 | 21½ | 113 | 2⅜ | 1¼ | 1½ | 1¼ | 1/16–⅛ | 8½ |
| Lafayette 1934 | 6-3¼x4⅜ | | | | .012 | .012 | A | Ch-C15 | .025 | VDM | VDM | .020 | Au. | 7 | 19 | 89 | 2 | 1 1/16 | 2½ | 1½ | ⅛ | |
| Lafayette 110-3510 1935 | 6-3¼x4⅜ | | | | .015 | .015 | A | Ch-C7 | .025 | VDM | VDM | .020 | Au. | 7 | 19 | 85 | 2 | 1 1/16 | | 1½ | ⅛ | 7 |
| Lafayette 3610 1936 | 6-3¼x4⅜ | .015 | 5A | 1¼A | .015 | .015 | A | AC-G8 | .023 | 10B | 3B | .020 | Au. | 7 | 19 | 100 | 2 | 1 1/16 | 2½ | 1½ | ⅛ | 7 |
| La Salle 328-V8 1929 | 8-3¼x4 1/16 | .004 | 9½B | 3B | .004C | .006C | B | AC-G10 | .026 | 7½B | 2B | .024 | A | 8 | 21 | 78 | 2⅜ | 2¾ | 1½E | 2½ | 1/16 | 7½ |
| La Salle 340-V8 1930 | 8-3⅛x4 1/16 | .004 | 9½B | 3B | .004C | .006C | B | AC-G10 | .026 | 18½B | 5½B | .020 | A | 8 | 24 | 74 | 2⅜ | 2¾ | 1½E | 1½ | 1/16 | 10½ |
| La Salle 345-V8 1931 | 8-3⅛x4 1/16 | .006 | 9½B | 3B | .004C | .006C | B | AC-G10 | .026 | 7½B | 2½B | .019 | A | 8 | 24 | 81 | 2⅜ | 2¾ | 2½–3E | 1½ | 1/16 | 8½ |
| La Salle 345-B-V8 1932 | 8-3⅛x4 1/16 | .006 | 6B | 1¾B | .006C | .008C | B | AC-G7 | .026 | 9B | 2¾B | .020 | Au. | 8 | 26 | 81 | 2⅜ | 2¾ | 2½–3½E | 1½ | 1/16–⅛ | 7¾ |
| La Salle 345-C-V8 1933 | 8-3⅛x4 1/16 | .006 | 6B | 1¾B | .006C | .008C | B | AC-D8 | .026 | 9B | 2¾B | .021 | Au. | 8 | 26 | 88 | 2⅜ | 2¾ | 2½–3½E | 1½ | 1/16–⅛ | 7¾ |
| La Salle 350 1934 | 8-3x4¼ | .015 | 6A | 2¼A | .006C | .009C | B | AC-G6 | .026 | 8B | 3B | .024 | Au. | 7 | 19 | 105 | 2¼ | 1 1/16 | 1–2 | ¼–1 | 1/16–⅛ | 4¾ |
| La Salle 1935, 36 | 8-3x4¾ | .015 | 6A | 2½A | .006C | .009C | B | AC-K9 | .025 | 8B | 3¼B | .015 | Au. | 7 | 16½ | 103 | 2¼ | 1 1/16 | 2 | 1 | 1/16 | 4¾ |
| La Salle V8-37-50 1937 | 8-3⅜x4½ | .000 | TC | TC | .000 | .000 | A | AC-K7 | .026 | 5B | 2¼B | .015 | Ad. | 7 | 25 | 155† | 2 1/32 | 2 3/32 | ¼–1 | ¼–1 | 0–1/16 | 4°–51′ |

# Tune Up Specifications—(1928 to 1937 Inclusive)—Continued

| MAKE AND MODEL | No. of Cylinders and Bore and Stroke | VALVES: Inlet Tappet Clearance for Valve Timing | VALVES: Intake Valve Opens Before or After T. C. — No. of Degrees (E—Exhaust Valve) | VALVES: Intake Valve Opens Before or After T. C. — No. of Flywheel Teeth (E—Exhaust Valve) | VALVES: Operating Tappet Clearance — Intake | VALVES: Operating Tappet Clearance — Exhaust | Rods Removed from | IGNITION: Spark Plug — Make and Model | IGNITION: Spark Plug — Gap | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — Spark Occurs °TC | IGNITION: Timing — No. of Flywheel Teeth Spark Occurs TC | IGNITION: Timing — Breaker Gap | IGNITION: Timing — Breaker Housing | Capacity Crank Case (Qts.) | Capacity Cooling System (Qts.) | Compression Pressure at Cranking Speed (Lbs.) (Standard Head) | CRANK-PIN: Diameter | CRANK-PIN: Length | FRONT AXLE: Caster (Degrees) | FRONT AXLE: Camber (Degrees) | FRONT AXLE: Toe-in (Inches) | FRONT AXLE: Kingpin Inclination (Degrees) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lincoln 1928-29-30 | 8-3½x5 | .004 | 2½B | 1B | .005C | .005C | B | Ch-2 | .027 | R1* | R1* | .020 | Re. | 10 | 30 | 72 | 2 | 2½ | 1-2E | 2½ | 0-1/16 | 6 |
| Lincoln 1931, 32 | 8-3½x5 | .003 | 2½B | 1B | .003C | .004C | B | Ch-2 | .027 | A2* | A2* | .020 | A | 10 | 34 | 80 | 2 | 2½ | 1-2 | 1 | 0-1/8 | 7½ |
| Lincoln V12 1932 | 12-3¼x4½ | .003 | 21B | 6¾B | .004C | .005C | B | Ch-2 | .027 | A2* | A2* | .020 | A | 12 | 34 | 81 | 2⅛ | 2¼ | 1-2 | 1 | 0-1/8 | 7½ |
| Lincoln KA-Ser. 511-V12 1933 | 12-3x4½ | .003 | 21B | 6¾B | .003C | .005C | B | Ch-2 | .026 | 7B | 2¼B | .018 | A | 11 | 32 | 89 | 2½ | 2 | 2 | 1 | 0-1/8 | 7½ |
| Lincoln KB-Ser. 251-V12 1933 | 12-3¼x4½ | .003 | 21B | 6¾B | .003C | .005C | B | Ch-2 | .026 | 7B | 2¼B | .018 | A | 12 | 34 | 83 | 2⅛ | 2¼ | 2 | 1 | 0-1/8 | 7½ |
| Lincoln V12 1934 | 12-3½x4½ | .003 | 21B | 7B | .003C | .005C | B | Ch-7 | .022 | 7B | 2¼B | .020 | A | 13 | 32 | 101 | 2⅜ | 2 | 1 | 1 | 0-1/8 | 7½ |
| Lincoln V12 1935-36-37 | 12-3½x4½ | .004 | 21B | 6¾B | .004C | .006C | B | Ch-7 | .022 | 7B | 2¼B | .015 | Au | 12 | 32 | 105 | 2½ | 2 | 8 | 1 | 1/16-1/8 | 7½ |
| Lincoln Zephyr 1936-37 | 12-2¾x3¾ | .013 | 19½B | 6¼B | .013C | .013C | A | Ch-H10 | .029 | 4B | 1¼B | .015 | Au | 6 | 27 | 100 | 2⅛ | 1 21/64 | 4 | ¾ | 1/16-⅛ | 4 |
| Marmon Roosevelt 8 1930 | 8-2¾x4¼ | .010C | 6B | 1½B | .008H | .008H | B | Ch-2 | .027 | 7B | 1¾B | .020 | A | 7 | 16 | 80 | 2 | 1¼ | 4½E | 1½ | 0-1/16 | 7 |
| Marmon 69 1930 | 8-2 11/16x4¼ | .010C | 6B | 1½B | .008H | .008H | B | Ch-8 | .025 | 7B | 1¾B | .022 | A | 7 | 16 | 83 | 2 | 1¼ | 4½E | 1½ | 0-1/16 | 7 |
| Marmon 79 1930-31 | 8-3 1/16x4¾ | .010C | TC | TC | .008H | .008H | B | Ch-8 | .025 | 5¾B | 1½B | .022 | A | 10 | 28 | 89 | 2⅜ | 1½ | 3½E | 1½ | 0-1/16 | 7 |
| Marmon Big 8 1930-31 | 8-3¼x4¾ | .010C | TC | TC | .008H | .008H | B | Ch-8 | .025 | 5¾B | 1½B | .022 | A | 10 | 28 | 89 | 2⅜ | 1½ | 5E | 1½ | 0-1/16 | 7 |
| Marmon 88 1931 | 8-3¼x4¾ | .010 | TC | TC | .008H | .008H | B | Ch-8 | .025 | 5¾B | 1¾B | .022 | A | 10 | 28 | 89 | 2⅜ | 1½ | 3E | 1½ | 0-1/16 | 7 |
| Marmon 70 1931-32 | 8-2 11/16x4¾ | .010 | 6B | 1½B | .008H | .008H | B | Ch-8 | .025 | 7½B | 2B | .020 | A | 6 | 16 | 89 | 2 | 1¼ | 4½E | 1½ | 0-1/16 | 7 |
| Marmon 16-V16 1931-32 | 16-3½x4 | .014 | 6B | 2B | .008H | .008H | B | Ch-C7 | .022 | 6B | 2B | .019 | A | 10 | 34 | 99 | 2⅝ | 1 13/16 | 3½E | 1½ | 1/16-⅛ | 7 |
| Marmon 125 1932 | 8-3¼x4¾ | .010 | TC | TC | .008H | .008H | B | Ch-8 | .025 | 5¾B | 1¾B | .022 | A | 10 | 28 | 91 | 2⅝ | 1½ | 4 | 1½ | 0-1/16 | 7 |
| Marquette 30-Early 1930 | 6-3 1/16x4⅝ | .010 | 5B | 1½B | .006H | .006H | B | AC-G12 | .026 | 5B | 1½B | .018 | A | 6 | 12 | 80 | 2⅛ | 1⅜ | 1¼-2¼E | 1-2 | 1/16-1/8 | 9½ |
| Marquette 30-Late 1930 | 6-3 1/16x4⅝ | .010 | 5B | 1½B | .006H | .006H | B | AC-G12 | .026 | 7B | 2B | .018 | A | 6 | 12 | 80 | 2⅛ | 1⅜ | 1¼-2¼E | 1-2 | 1/16-1/8 | 9½ |
| Nash Std. 6 1928, 29 | 6-3½x4 | .007 | 5A | 1¼A | .008H | .008H | A | AC-G14 | .020 | FM | FM | .020 | Au. | 5 | 10 | 75 | 1⅞ | 1 1/16 | 2-L⁵ | 0-2 | ⅛ | 7 |
| Nash 430-Special 6 1929 | 6-3¼x4½ | .012 | 15A | 4¾A | .012H | .012H | B | AC-J9 | .020 | VDM | VDM | .020 | A | 7 | 17 | 78 | 2⅛ | 1⅝ | 2-L⁵ | 0-1½ | ⅛ | 6 |
| Nash Adv. Twn. Ign. 6 1928, 29 | 6-3 1/16x5 | .012 | 15A | 5A | .012H | .012H | B | AC-J9 | .025 | VDM | VDM | .022 | A | 8 | 19 | 75 | 2¼ | 1½ | 0 | 0-1½ | ⅛ | 6 |
| Nash 450-Single Six 1930 | 6-3 1/16x4⅜ | .008 | 5A | 1¼A | .008H | .008H | A | AC-G14 | .020 | FM | FM | .020 | Au. | 5 | 12 | 75 | 1¾ | 1 1/16 | 2-L⁵ | 0-2 | ⅛ | 7 |
| Nash 480-Twn. Ign. 6 1930 | 6-3⅜x4½ | .012 | 15A | 5A | .012H | .012H | B | AC-G14 | .020 | 15B | 5B | .020 | A | 6 | 16 | 75 | 2⅛ | 1⅝ | 1-L⁵ | 0-1½ | ⅛ | 6 |
| Nash 490-Twn. Ign. 8 1930 | 8-3¼x4½ | .012 | 15A | 5A | .012H | .012H | B | AC-J9 | .020 | VDM | VDM | .020 | A | 8 | 22 | 82 | 2⅛ | 1⅜ | 0-L⁵ | 0-1½ | ⅛ | 6 |
| Nash 660-Standard 6 1931 | 6-3 1/16x4⅜ | .008 | 5A | 1½A | .008H | .008H | A | AC-G14 | .020 | FM | FM | .020 | Au. | 5 | 12 | 75 | 1¾ | 1 1/16 | 2-L⁵ | 0-1½ | ⅛ | 7 |
| Nash 870 1931 | 8-2 7/16x4⅜ | .008 | 5A | 1½A | .008H | .008H | A | AC-G14 | .020 | FM | FM | .022 | | 6 | 15 | 75 | 1⅞ | 1⅛ | 2-L⁵ | 0-1½ | ⅛ | 7 |
| Nash 880-Twn. Ign. 8 1931 | 8-3x4¼ | .012 | 15A | 4¾A | .012H | .012H | B | AC-K12 | .020 | VDM | VDM | .020 | A | 8 | 16½ | 82 | 2 | 1 1/16 | 2-L⁵ | 0-1½ | ⅛ | 7 |
| Nash 890-Twn. Ign. 8 1931 | 8-3¼x4½ | .012 | 15A | 4¾A | .012H | .012H | B | AC-J9 | .020 | VDM | VDM | .020 | A | 10 | 22 | 82 | 2⅛ | 1⅜ | 0-L⁵ | 0-1½ | ⅛ | 6 |
| Nash 960 1932 | 6-3¼x4⅜ | .008 | 5A | 1½A | .008H | .008H | A | AC-G14 | .020 | FM | FM | .022 | Au. | 5 | 12 | 75 | 1¾ | 1 1/16 | 2-L⁵ | 0-1½ | ⅛ | 7 |
| Nash 970 1932 | 8 2 7/16x4⅜ | .008 | 5A | 1½A | .008H | .008H | A | AC-G14 | .020 | FM | FM | .022 | A | 6 | 15 | 75 | 1⅞ | 1⅛ | 2-L⁵ | 0 1½ | ⅛ | 7 |
| Nash 980-Twn. Ign. 8 1932 | 8-3x4¼ | .012 | 15A | 4¾A | .012H | .012H | B | AC-K12 | .020 | 15B | 4¾B | .020 | A | 8 | 20 | 82 | 2 | 1 1/16 | 2-L⁵ | 0-1½ | ⅛ | 7 |
| Nash 990-Twn. Ign. 8 1932 | 8-3¼x4½ | .012 | 15A | 4¾A | .012H | .012H | B | AC-J9 | .020 | VDM | VDM | .020 | A | 10 | 22 | 82 | 2⅛ | 1⅜ | 0-L⁵ | 0-1½ | ⅛ | 6 |
| Nash 1060-Big Six 1932 | 6-3 1/16x4⅜ | .008 | 5½A | 1¾A | .008H | .008H | A | AC-G10 | .020 | 5B | VDM | .020 | Au. | 6 | 15 | 75 | 2 | 1 1/16 | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1080-Special 8 1932 | 8-3 1/16x4¼ | .012 | 15A | 4¾A | .012H | .012H | B | AC-K12 | .020 | 15B | 4¾B | .025 | A | 8 | 21 | 75 | 1⅞ | 1⅛ | 0 | 0-1½ | ⅛ | 7 |
| Nash 1090-Adv. Twn. Ign. 8 1932 | 8-3⅜x4½ | .012 | 15A | 4¾A | .012H | .012H | B | AC-J9 | .020 | VDM | VDM | .020 | A | 10 | 22 | 82 | 2 | 1¼ | 0 | 0-1½ | ⅛ | 6 |
| Nash 1070-Standard 1932 | 8-3x4⅜ | .008 | 5A | 1½A | .008H | .008H | A | AC-G10 | .020 | 5A | 1½A | .022 | Re. | 7 | 17 | 75 | 1⅞ | 1½ | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1170-Special 8 1933 | 8-3x4⅜ | .008 | 5A | 1½A | .008H | .008H | A | AC-G10 | .020 | 5A | 1½A | .022 | Re. | 7 | 17 | 75 | 1⅞ | 1½ | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1120-Big Six 1933 | 6-3 1/16x4⅜ | .... | .... | .008H | .008H | A | AC-K12 | .020 | 10B | 3B | .020 | .... | 7 | 19 | 84 | 2 | 1 1/16 | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1130-Standard 8 1933 | 8-3x4⅜ | .008 | 5A | ½A | .008H | .008H | A | AC-G10 | .020 | 10B | 3B | .022 | Re. | 7 | 16 | 84 | 1⅞ | 1⅛ | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1180-Adv. Twn. Ign. 8 1933 | 8-3½x4¼ | .012 | 15A | 4¾A | .012H | .012H | B | AC-K12 | .020 | VDM | VDM | .025 | A | 8 | 21 | 80 | 2 | 1¼ | 0 | 0-1½ | ⅛ | 7 |
| Nash 1190-Amb. Twn. Ign. 8 1933 | 8-3½x4½ | .012 | 15A | 4¾A | .012H | .012H | B | AC-J9 | .020 | VDM | VDM | .020 | A | 10 | 22 | 80 | 2⅛ | 1⅜ | 0 | 0-1½ | ⅛ | 6 |
| Nash 1220-Big Six Twn. Ign. 1934 | 6-3½x4⅜ | .015 | VDM | VDM | .015H | .015H | A | AC-K12 | .022 | VDM | VDM | .020 | .... | 7 | 17½ | 82 | 2 | 1 11/16 | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1280-Adv. Twn. Ign. 8 1934 | 8-3½x4¼ | .015 | VDM | VDM | .015H | .015H | A | AC-K12 | .022 | VDM | VDM | .020 | Au. | 8 | 21 | 82 | 2 | 1 1/16 | 2½ | 0-1½ | ⅛ | 7 |
| Nash 1290-Amb.Twn. Ign. 8 1934 | 8-3½x4½ | .015 | VDM | VDM | .015H | .015H | B | AC-K12 | .022 | VDM | VDM | .020 | .... | 10 | 22 | 82 | 2⅛ | 1⅜ | 0 | 0-1½ | ⅛ | 6 |
| Nash 3520-Adv. Twn. Ign. 6 1935 | 6-3½x4⅜ | .015 | VDM | VDM | .015H | .015H | A | AC-K12 | .022 | VDM | VDM | .020 | .... | 7 | 17½ | 89 | 2 | 1 11/16 | 2½ | 1½ | ⅛ | 7 |
| Nash 3580-Adv. Twn. Ign. 8 1935 | 8-3½x4¼ | .015 | VDM | VDM | .015H | .015H | B | AC-K12 | .022 | VDM | VDM | .020 | .... | 8 | 21 | 80 | 2 | 1 1/16 | 2½ | 1½ | ⅛ | 7 |
| Nash Ambassador 8-3588 1935 | 8-3½x4¼ | .015 | VDM | VDM | .015H | .015H | B | AC-K12 | .022 | VDM | VDM | .020 | .... | 8 | 21 | 80 | 2⅛ | 1⅜ | 0 | 1½ | ⅛ | 6 |
| Nash 3640-400 1935 | 6-3⅝x4⅜ | .... | CSM | CSM | .013H | .013H | A | AC-K12 | .022 | VDM | VDM | .020 | Au. | 7 | 18 | 83 | 2 | 1 11/16 | 2¼ | 1½ | ⅛ | 7 |
| Nash 3640A-400 1936 | 6-3⅝x4⅜ | .015 | 5A | 1½A | .015 | .015 | A | AC-G8 | .025 | 10B | 3B | .020 | Au. | 7 | 18 | 100 | 2 | 1 11/16 | 2½ | 1½ | ⅛ | 7 |
| Nash Ambassador 1936 | 6-3⅝x4⅜ | .015 | CSM | CSM | .015H | .015H | A | AC-K12 | .025 | VDM | VDM | .020 | Au. | 7 | 17½ | 100 | 2 | 1 1/16 | 2½ | 1½ | ⅛ | 7 |
| Nash Ambassador Super 8 1936 | 8-3½x4¼ | .015 | CSM | CSM | .015H | .015H | B | AC-K12 | .025 | 15B | .... | .020 | Au. | 8 | 21 | 90 | 2 | 1 1/16 | 2½ | 1½ | ⅛ | 7 |
| Nash Ambassador 6-3720 1937 | 6-3⅝x4⅜ | .008H | 24B | .... | .008H | .015H | A | AC-K7 | .027 | 4B | VDM | .022 | Au. | 7 | 17 | 100 | 2 | 1 21/64 | 2½ | 1½ | ⅛ | 7 |
| Nash Ambassador 8-3780 1937 | 8-3½x4¼ | .008 | 15B | .... | .008 | .015H | B | AC-K7 | .027 | 9B | VDM | .020 | Au. | 7 | 18 | 90 | 2 | 1 11/16 | 2 | 1½ | ⅛ | 7 |
| Nash Lafayette 400 1937 | 6-3⅝x4⅜ | .015 | 5A | .... | .015 | .015 | A | AC-G8 | .025 | TC | VDM | .022 | Au. | 6 | 20 | 100 | 2 | 1 21/64 | 2½ | 1½ | ⅛ | 7 |
| Oakland AAS 1929 | 6-3⅜x4¼ | .010 | 5A | 1¼A | .008H | .008H | B | AC-B | .025 | 4B | 1¼B | .021 | Au. | 6 | 22 | 72 | 2¼ | 1¼ | 1½-2¼E | 2½ | ½-1 | 7½ |
| Oakland 101-V8 1930 | 8-3 1/16x3⅜ | .015 | TC | TC | .012H | .012H | A | AC-G12 | .025 | 7B | 2¼B | .022 | Au. | 7 | 25 | 78 | 2¼ | 1⅜ | 1¾-2½E | 1¾ | 0-1/16 | 9½ |
| Oakland 301-V8 1931 | 8-3 1/16x3⅜ | .015 | TC | TC | .012H | .012H | A | AC-G12 | .025 | 7B | 2¼B | .016 | Au. | 7 | 25 | 78 | 2¼ | 1¼ | 1¾-2½E | 1¾ | 0-1/16 | 9½ |
| Oldsmobile F-29 1929 | 6-3 1/16x4⅛ | .010 | TC | TC | .008H | .010H | (u) | AC-G12 | .025 | 8B | 2½B | .021 | Au. | 6 | 13 | 80 | 1⅞ | 1⅜ | 3E | 1¾ | ⅛-⅜ | 9½ |
| Oldsmobile F-30 1930 | 6-3 1/16x4⅛ | .010 | TC | TC | .008H | .010H | A | AC-G12 | .025 | .030"B | 2¾B | .021 | Au. | 6 | 13 | 80 | 1⅞ | 1⅜ | 3E | 1¾ | ⅛-⅜ | 9½ |
| Oldsmobile 1931, 32 | 6-3 1/16x4⅛ | .010 | TC | TC | .008H | .010H | A | AC-G9 | .025 | 4¼B | 1¼B | .021 | Au. | 6 | 16¼ | 83 | 1⅞ | 1⅜ | 3½L¹⁰ | 1¾ | ⅛-⅜ | 9½ |
| Oldsmobile L-32 1932 | 8-3x4¼ | .010 | TC | TC | .008H | .010H | B | AC-G9 | .025 | 4¼B | 1¾B | .021 | Au. | 7 | 16½ | 89 | 2¼ | 1⅜ | 3½L¹⁰ | 1¾ | ⅛-⅜ | 9½ |
| Oldsmobile F-33 1933 | 6-3⅜x4⅛ | .010 | TC | TC | .008H | .010H | A | AC-G9 | .025 | 3½B | 1½B | .021 | A | 6 | 17 | 83 | 1⅞ | 1¾ | 2½ | 1¾ | ⅛-⅜ | 9½ |
| Oldsmobile L-33 1933 | 8-3x4¼ | .010 | TC | TC | .008H | .010H | B | AC-G9 | .025 | 3½B | 1½B | .021 | A | 7 | 19 | 89 | 2¼ | 1⅜ | 2½ | 1¾ | ⅛-⅜ | 9½ |
| Oldsmobile F-34 1934 | 6-3 1/16x4⅛ | .013 | TC | TC | .008H | .00⁹H | A | AC-G9 | .025 | VDM | VDM | .021 | Au. | 6 | 15 | 93 | 1⅞ | 1⅜ | 2½-3E | ¼-1 | ⅛-⅜ | 4½ |
| Oldsmobile L-34 1934 | 8-3x4¼ | .010 | TC | TC | .008H | .010H | B | AC-G9 | .025 | VDM | VDM | .021 | Au. | 7 | 19 | 93 | 2¼ | 1⅜ | 1½-2E | ¼-1 | ⅛-⅜ | 4½ |
| Oldsmobile F-35 1935 | 6-3 1/16x4⅛ | .010 | 5B | 2B | .008H | 010H | A | AC-G9 | .025 | 2B | 1B | .021 | Au. | 6 | 13 | 99 | 2 | 1⅜ | 1½-2¼ | ½-1 | ⅛-⅜ | 5 |
| Oldsmobile L-35 1935 | 8-3x4¼ | .010 | TC | TC | .008H | .010H | B | AC-G9 | .025 | 3B | 1B | .021 | Au. | 7 | 16 | 103 | 2¼ | 1⅜ | 1½-2¼ | ½-1 | ⅛-⅜ | 5 |
| Oldsmobile F-36 1936 | 6-3 1/16x4⅛ | .010 | 5B | 2B | .008H | 010H | A | AC-G9 | .033 | TC | TC | .020 | Au. | 6 | 13 | 99 | 2 | 1⅜ | 1½-2¼ | ½-1 | ⅛-⅜ | 5°51′ |
| Oldsmobile L-36 1936 | 8-3x4¼ | .010 | TC | TC | .008H | .010H | B | AC-G9 | .033 | 2B | ¾B | .015 | Au. | 7 | 16 | 103 | 2¼ | 1⅜ | 1½-2¼ | ¼-1 | ⅛-⅜ | 5°51′ |
| Oldsmobile F37 1937 | 6-3 7/16x4⅛ | .0125 | 5B | 2B | .008H | .011 | A | AC-K9 | .040 | TC | TC | .020 | Au. | 6 | 16 | 146† | 2⅛ | 1⅜ | 0-N¾ | ½-1 | ⅛-⅜ | 4° 51½′ |
| Oldsmobile L37 1937 | 8-3¼x3 7/8 | .0124 | TC | TC | .008H | .011 | A | AC-K9 | .030 | 2B | ¾B | .015 | Au. | 7 | 20 | 152† | 2⅛ | 1⅜ | 0-N¾ | ½-1 | ⅛-⅜ | 4° 51½′ |
| Packard 726 1929-30 | 8-3 1/16x5 | .004 | 20B | 6¾B | .004H | .004H | (t) | AC-Z | .025 | 8B | 2¾B | .017 | A | 8 | 20 | ..... | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 733 1929-30 | 8-3 1/16x5 | .004 | 20B | 6¾B | .004H | .004H | (t) | AC-Z | .025 | 8B | 2¾B | .017 | A | 8 | 20 | ..... | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 740 1929-30 | 8-3½x5 | .004 | 20B | 6¾B | .004H | .004H | A | AC-Z | .025 | 8B | 2¾B | .017 | A | 10 | 25 | ..... | 2 3/16 | 1¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 745 1929 30 | 8-3½x5 | .004 | 20B | 6¾B | .004H | .004H | A | AC-Z | .025 | 8B | 2¾B | .017 | A | 10 | 26 | ..... | 2 3/16 | 1¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 826-Standard 1931 | 8-3 1/16x5 | .004 | 20B | 6½B | .004H | .004H | (t) | AC-Z | .025 | FM | FM | .017 | A | 8 | 20 | 84 | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 833-Standard 1931 | 8-3 1/16x5 | .004 | 20B | 6 7/16B | .004H | .004H | (t) | AC-Z | .025 | FM | FM | .017 | A | 8 | 20 | 84 | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 840-DeLuxe 1931 | 8-3½x5 | .004 | 20B | 6½B | .004H | .004H | A | AC-Z | .025 | FM | FM | .017 | A | 10 | 26 | 78 | 2 3/16 | 1¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 845-DeLuxe 1931 | 8-3½x5 | .004 | 20B | 6½B | .004H | .004H | A | AC-Z | .025 | FM | FM | .017 | A | 10 | 26 | 78 | 2 3/16 | 1¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 900-Lt. 8 1932 | 8-3 1/16x5 | .004 | 20B | 6½B | .004H | .004H | (t) | AC-K9 | .025 | 9B | 3B | .017 | A | 8 | 19 | 99 | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 901-Standard 1932 | 8-3 1/16x5 | .004 | 20B | 6½B | .004H | .004H | (t) | AC-K9 | .025 | 9B | 3B | .017 | A | 8 | 20 | 99 | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 902-Standard 1932 | 8-3 1/16x5 | .004 | 20B | 6½B | .004H | .004H | (t) | AC-K9 | .025 | 9B | 3B | .017 | A | 8 | 20 | •99 | 2 3/16 | 1⅜ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 903-DeLuxe 1932 | 8-3½x5 | .004 | 20B | 6 7/16B | .004H | .004H | A | AC-K9 | .025 | 9B | 3½B | .017 | A | 10 | 26 | 99 | 2 3/16 | 1¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 904-DeLuxe 1932 | 8-3½x5 | .004 | 20B | 6½B | .004H | .004H | A | AC-K9 | .025 | 9B | 3½B | .017 | A | 10 | 26 | 99 | 2 3/16 | 1¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 905-V12 1932 | 12-3 1/16x3½ | .000 | TC | TC | AA | AA | (t) | AC-K9 | .025 | 7½B | 2½B | .020 | Au. | 8 | 40 | 99 | 2½ | 2¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 906-V12 1932 | 12-3 1/16x3½ | .000 | TC | TC | AA | AA | (t) | AC-K9 | .025 | 7½B | 2½B | .020 | Au. | 8 | 40 | 99 | 2½ | 2¼ | 1-L¹¹ | 1½ | ⅛ | 8½ |
| Packard 1001-Standard 1933 | 8-3 1/16x5 | .004 | 30B | 10B | .004H | .004H | (t) | AC-K7 | .025 | 7½B | 2½B | .020 | Au. | 8 | 20 | 99 | 2 3/16 | 1⅜ | 3¼ | 1½ | 0-1/16 | 8½ |
| Packard 1002-Standard 1933 | 8-3 1/16x5 | .004 | 30B | 10B | .004H | .004H | (t) | AC-K7 | .025 | 7½B | 2½B | .020 | Au. | 8 | 20 | 99 | 2 3/16 | 1⅜ | 3¼ | 1½ | 0-1/16 | 8½ |
| Packard 1003-Super 8 1933 | 8-3½x5 | .004 | 30B | 10B | .004H | .004H | A | AC-K7 | .025 | 7½B | 2½B | .020 | Au. | 10 | 20 | 99 | 2 3/16 | 1¼ | 3¼ | 1½ | 0-1/16 | 8½ |
| Packard 1004-Super 8 1933 | 8-3½x5 | .004 | 30B | 10B | .004H | .004H | A | AC-K7 | .025 | 7½B | 2½B | .020 | Au. | 10 | 20 | 99 | 2 3/16 | 1¼ | 3¼ | 1½ | 0-1/16 | 8½ |
| Packard 1005-V12 1933 | 12-3 1/16x4 | .000 | TC | TC | AA | AA | (t) | AC-K7 | .025 | 5½B | 1¾B | .020 | Au. | 10 | 40 | 99 | 2½ | 2¼ | 1½ | 1½ | 0-1/16 | 8½ |

# Tune Up Specifications—(1928 to 1937 Inclusive)—Continued

| MAKE AND MODEL | No. of Cylinders and Bore and Stroke | VALVES: Inlet Tappet Clearance for Valve Timing | VALVES: Intake Valve Opens Before or After T. C. — No. of Degrees (E=Exhaust Valve) | VALVES: Intake Valve Opens Before or After T. C. — No. of Flywheel Teeth (E=Exhaust Valve) | VALVES: Operating Tappet Clearance — Intake | VALVES: Operating Tappet Clearance — Exhaust | Rods Removed from | IGNITION: Spark Plug — Make and Model | IGNITION: Spark Plug — Gap | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — Spark Occurs °TC | IGNITION: Timing — No. of Flywheel Teeth Spark Occurs TC | IGNITION: Breaker Gap | IGNITION: Breaker Housing | Capacity Crank Case (Qts.) | Capacity Cooling System (Qts.) | Compression Pressure at Cranking Speed (Lbs.) (Standard Head) | CRANK-PIN: Diameter | CRANK-PIN: Length | FRONT AXLE: Caster (Degrees) | FRONT AXLE: Camber (Degrees) | FRONT AXLE: Toe-in (Inches) | FRONT AXLE: Kingpin Inclination (Degrees) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Packard 1006-V12 1933 | 12-3 1/16x4 | .000 | TC | TC | AA | AA | (t) | AC-K7 | .025 | 5½B | 13/4B | .020 | Au. | 10 | 40 | 99 | 2 1/2 | 2¼ | 1½ | 1½ | 0–1/16 | 8½ |
| Packard 1100, 1101, 1102 1934 | 8-3 1/16x5 | .004 | 30B | 10B | .004H | .006H | (t) | AC-K7 | .025 | 6B | 2B | .020 | Au. | 8 | 20 | 99 | 2 1/16 | 1 3/32 | 1 | 1 | 0–1/16 | 9 |
| Packard 1103, 4, 5-Super 8 1934 | 8-3½x5 | .004 | 30B | 10B | .004H | .006H | A | AC-K7 | .025 | 6B | 2B | .020 | Au. | 10 | 20 | 99 | 2 3/32 | 1¼ | 1 | 1 | 0–1/16 | 9 |
| Packard 1107, 1108-V12 1934 | 12-3 1/16x4 | .000 | TC | TC | AA | AA | (t) | AC-K9 | .025 | 8B | 2½B | .020 | Au. | 10 | 40 | 104 | 2½ | 2¼ | 1½ | 1 | 0–1/16 | 9 |
| Packard 1200, 1, 2 1935 | 8-3 1/16x5 | .004 | 30B | 10B | .004H | .006H | (t) | CA-J8-K7 | .025 | 6B | 2B | .020 | Au. | 8 | 20 | 110 | 2 3/32 | 1 3/8 | 1½ | 1 | 0–1/16 | 9 |
| Packard 1203, 4, 5-Super 8 1935 | 8-3½x5 | .004 | 30B | 10B | .004H | .006H | A | CA-J8-K7 | .025 | 6B | 2B | .020 | Au. | 10 | 20 | 105 | 2 3/32 | 1¼ | 1½ | 1 | 0–1/16 | 9 |
| Packard 1207-8-V12 1935 | 12-3 1/16x4 1/4 | .000 | TC | TC | AA | AA | (t) | AC-K7 | .025 | 8B | 2½B | .020 | Au. | 10 | 40 | 108 | 2½ | 2¼ | 1½ | 1 | 0–1/16 | 9 |
| Packard 120-120A 1935 | 8-3 1/4x3 7/8 | .007 | 5A | 2A | .007H | .009H | A | AC-K7 | .025 | 5B | 2B | .020 | Au. | 7 | 16½ | 110 | 2 3/32 | 1 3/8 | 2 | 1 | 0–1/8 | 1½ |
| Packard 36-120B 1936 | 8-3¼x4¼ | .006 | 7B | 2¾B | .007H | .010H | A | CA-J8-K7 | .029 | 7B | 2¾B | .020 | Au. | 7 | 18 | 110 | 2 3/32 | 1 3/8 | 2 | 1 | 0–1/8 | 1½ |
| Packard 8 1936 | 8-3½x5 | .004 | 30B | 9¾B | .004H | .006H | (t) | CA-J8-K7 | .029 | 6B | 2B | .020 | Au. | 8 | 20 | 110 | 2 1/16 | 1 3/32 | 1 | 1 | 0–1/16 | 9 |
| Packard Super 8 1936 | 8-3½x5 | .004 | 30B | 9¾B | .004H | .006H | A | CA-J8-K7 | .029 | 6B | 2B | .020 | Au. | 9½ | 22 | 110 | 2 1/16 | 1¼ | 1 | 1 | 0–1/16 | 9 |
| Packard Twelve 1936 | 12-3 1/16x4 1/4 | .004 | TC | TC | AA | AA | (t) | CA-J8-K7 | .029 | 8B | 2½B | .020 | Au. | 10 | 40 | 110 | 2½ | 2¼ | 1 | 1 | 0–1/16 | 9 |
| Packard 115C 1937 | 6-3 1/16x4 1/4 | .013E | 5B | 2B | .007H | .010H | A | AC-Y4° | .025 | 4B | 1½B | .015 | Au. | 7 | 17 | 110 | 2 3/32 | 1¼ | 2½±½ | 1±¼ | 1/16±1/8 | 1½ |
| Packard 120C 1937 | 8-3 1/4x4 1/4 | .013E | 5B | 2B | .007H | .010H | A | AC-Y4° | .025 | 7B | 2¾B | .015 | Au. | 7 | 20 | 110 | 2 3/32 | 1¼ | 2½±½ | 1±¼ | 1/16±1/16 | 1½ |
| Packard 1500, 1, 2 1937 | 8-3 1/16x5 | .005E | 30B | 9¾B | .004H | .006H | B | AC-Y4° | .025 | 6B | 2½B | .015 | Au. | 8 | 24 | 110 | 2 1/16 | 1 3/32 | 2½±½ | 1±¼ | 1/16±1/16 | 1½ |
| Packard 1506, 7, 8 1937 | 12-3 1/16x4 1/4 | .000 | TC | TC | .000 | .000 | B | AC-Y4° | .025 | 6B | 2B | .020 | Au. | 10 | 40 | 110 | 2½ | 2¼ | 0, N-½N | 1±¼ | 1/16±1/16 | 1½ |
| Pierce-Arrow 133 1929-30 | 8-3½x4¾ | .010 | 5A | 1½A | .003H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .017 | A. | 9 | 26 | 76 | 2¼ | 1¼ | 1-1½L[11] | 1/2-1½ | 1/16-1/8 | 8 |
| Pierce-Arrow 143 1929-30 | 8-3½x4¾ | .010 | 5A | 1½A | .003H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .017 | A. | 9 | 26 | 76 | 2¼ | 1¼ | 1-1½L[11] | 1/2-1½ | 1/16-1/8 | 8 |
| Pierce-Arrow A 1930-31 | 8-3½x5 | .010 | 5A | 1½A | .003H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .018 | A. | 9 | 26 | 77 | 2¼ | 1¼ | 1-1½L[11] | 1/2-1½ | 1/16-3/16 | 8 |
| Pierce-Arrow B 1930-31 | 8-3½x4¾ | .010 | 5A | 1½A | .003H | .006H | A | Ch-C4 | .025 | 8½B | 2½B | .018 | A. | 9 | 26 | 77 | 2¼ | 1¼ | 1-1½L[11] | 1/2-1½ | 1/16-3/16 | 8 |
| Pierce-Arrow C 1930-31 | 8-3½x4¾ | .010 | 5A | 1½A | .003H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .018 | A. | 9 | 26 | 77 | 2¼ | 1¼ | 1-1½L[11] | 1/2-1½ | 1/16-3/16 | 8 |
| Pierce-Arrow 41 1931 | 8-3½x5 | .010 | 5A | 1½A | .004H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .018 | A. | 9 | 26 | 77 | 2¼ | 1⅜ | 1-1½L[11] | 1/2-1½ | 1/16-1/8 | 8 |
| Pierce-Arrow 42 1931 | 8-3½x5 | .010 | 5A | 1½A | .004H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .018 | A. | 9 | 26 | 77 | 2¼ | 1⅜ | 1-1½L[11] | 1/2-1½ | 1/16-1/8 | 8 |
| Pierce-Arrow 43 1931 | 8-3½x4¾ | .010 | 5A | 1½A | .004H | .006H | A | Ch-C4 | .025 | 8½B | 2¾B | .018 | A. | 9 | 26 | 77 | 2¼ | 1⅜ | 1-1½L[11] | 1/2-1½ | 1/16-1/8 | 8 |
| Pierce-Arrow 54 1932 | 8-3½x4¾ | .004 | 5B | 1½B | .004H | .006H | A | Ch-C4 | .022 | 8B | 2½B | .018 | A. | 9 | 26 | 76 | 2¼ | 1¼ | 1-1½ | 1 | 1/16 | 8 |
| Pierce-Arrow 52-V12 1932 | 12x3½x4 | .004 | 4B | 1¼B | .004H | .006H | A | Ch-N2 | .022 | 8B | 2½B | .018 | A. | 10 | 38 | 76 | 2 1/8 | 2⅛ | 1-1½ | 1 | 1/16 | 8 |
| Pierce-Arrow 53-V12 1932 | 12-3¼x4 | .004 | 4B | 1¼B | .004H | .006H | A | Ch-N2 | .022 | 8B | 2½B | .018 | A. | 10 | 38 | 76 | 2 1/16 | 2⅛ | 1-1½ | 1 | 1/16 | 8 |
| Pierce-Arrow 836 1933 | 8-3½x4¾ | .000 | 5A | 1½A | AA | AA | A | Ch-C4 | .025 | 5B | 1½B | .018 | A. | 9 | 26 | 89 | 2¼ | 1¼ | 2-2½L[11] | 1/2-1½ | 1/16-1/4 | 8 |
| Pierce-Arrow 1236-V12 1933 | 12-3½x4 | .000 | 19B | 6B | AA | AA | A | Ch-N2 | .023 | 5B | 1½B | .018 | A. | 10 | 38 | 99 | 2 1/8 | 2¼ | 2-2½L[11] | 1/2-1½ | 1/16-1/4 | 8 |
| Pierce-Arrow 1242 1247-V12 1933 | 12-3½x4 | .000 | 19B | 6B | AA | AA | A | Ch-N2 | .023 | 5B | 1½B | .018 | A. | 10 | 38 | 99 | 2 1/8 | 2¼ | 1/2-1L[11] | 1/2-1½ | 1/16-1/4 | 8 |
| Pierce-Arrow 840A 1934 | 8-3½x5 | .000 | 5A | 1½A | AA | AA | A | Ch-J5 | .023 | FM | FM | .018 | A. | 9 | 26 | 83 | 2¼ | 1¼ | 1/2-1L[11] | 1/2-1½ | 1/4 | 8 |
| Pierce-Arrow 1240A-48A 1934 | 12-3½x4 | .000 | 19B | 6B | AA | AA | A | Ch-J5 | .023 | FM | FM | .018 | A. | 10 | 38 | 100 | 2 1/8 | 2¼ | 1/2-1L[11] | 1/2-1½ | 1/4 | 8 |
| Pierce-Arrow 836A 1934 | 8-3½x4¾ | .006 | 5B | 1½B | .004 | .006 | A | Ch-J5 | .023 | FM | FM | .020 | A. | 9 | 26 | 83 | 2 1/16 | 1¼ | ¾ | 1 | 1/4 | 8 |
| Pierce-Arrow 845 1935 | 8-3½x5 | .010 | 5A | 1½A | AA | AA | A | Ch-J5C | .023 | 4B | 1½B | .018 | A. | 9 | 28 | 80 | 2¼ | 1¼ | ¾ | 1 | 1/4 | 8 |
| Pierce-Arrow 1245-55-V12 1935 | 12-3½x4 | .004 | 19B | 5B | AA | AA | A | Ch-J5 | .023 | 5B | 1½B | .018 | A. | 12 | 40 | 85 | 2 1/16 | 2¼ | ¾ | 1 | 1/4 | 8 |
| Pierce-Arrow 1601 1936 | 8-3½x5 | .010 | 5A | 1½A | AA | AA | A | Ch-J6 | .025 | 2B | ⅛B | .018 | A. | 10 | 25 | 80 | 2¼ | 1¼ | ¾ | 1 | 1/4 | 8 |
| Pierce-Arrow 1602 1936 | 12-3¼x4 | .004 | 19B | 6B | AA | AA | A | Ch-J6 | .025 | 5B | 1½B | .018 | A. | 13 | 38 | 85 | 2 1/16 | 2¼ | ¾ | 1 | 1/4 | 8 |
| Pierce-Arrow 1603 1936 | 12-3½x4 | .004 | 19B | 6B | AA | AA | A | Ch-J6 | .025 | 5B | 1½B | .018 | A. | 13 | 38 | 85 | 2 1/16 | 2¼ | ¾ | 1 | 1/4 | 8 |
| Plymouth Q 1928-29 | 4-3 5/16x4 1/16 | .008 | 5A | 1½A | .004H | .006H | A | AC-A | .028 | .050B | 3½B | .020 | A. | 4 | 14 | 68 | 1 7/8 | 1½ | 0-2E | 0-2 | 1/8-1/16 | 7 |
| Plymouth U 1929-30 | 4-3 5/16x4 1/4 | .008 | 5A | 1½A | .004H | .006H | A | AC-A | .028 | .050B | 3½B | .020 | A. | 4 | 14 | 68 | 1 7/8 | 1 3/16 | 1-2 | 1 | 1/8-1/16 | 7 |
| Plymouth 30U 1930-31 | 4-3 5/16x4 3/4 | .008 | 6A | 2A | .005H | .007H | A | AC-G12 | .022 | .050B | 3½B | .020 | A. | 6 | 10 | 68 | 2 | 1 5/16 | 1½-2 | 2 | 1/16-3/32 | 7 |
| Plymouth PA 1931-32 | 4-3 5/16x4 3/4 | .008 | 6A | 2A | .005H | .007H | A | AC-G12 | .028 | 10½B | 3½B | .020 | A. | 6 | 14½ | 74 | 2 | 1 5/16 | 1-3 | ¼-¾ | 0-1/16 | 7 |
| Plymouth PB 1932 | 4-3 5/16x4 3/4 | .008 | 6A | 2A | .005H | .007H | A | AC-S9 | .028 | 10B | 3B | .020 | Au. | 6 | 14½ | 74 | 2 | 1 5/16 | 1-3 | ¼-¾ | 0-1/16 | 7 |
| Plymouth PC & PC-Std. 1933 | 6-3 1/16x4 1/16 | .011 | 6A | 2½A | .007H | .009H | A | AC-S9 | .025 | (l) | (l) | .020 | Au. | 5 | 13 | 90 | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/16 | 9 |
| Plymouth PD 1933 | 6-3 1/16x4 1/16 | .011 | 6A | 2½A | .007H | .009H | A | AC-S9 | .025 | TC | TC | .020 | Au. | 5 | 13 | 90 | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/16 | 9 |
| Plymouth PE 1934 | 6-3 1/16x4 3/16 | .011 | 6A | 2¼A | .007H | .009H | A | AC-S9 | .025 | 3A | .004A | .020 | Au. | 5 | 16 | 95 | 1 11/16 | 1 | 1/2-2½ | ¼-¾ | 1/16-1/8 | 9 |
| Plymouth PF 1934 | 6-3 1/16x4 3/16 | .011 | 6A | 2¼A | .007H | .009H | A | AC-S9 | .025 | 9B | .032B | .020 | Au. | 5 | 14 | 95 | 1 11/16 | 1 | 1/2-2½ | ¼-¾ | 1/16-1/8 | 9 |
| Plymouth PG 1934 | 6-3 1/16x4 3/16 | .011 | 6A | 2¼A | .007H | .009H | A | AC-S9 | .025 | 3B | .004B | .020 | Au. | 5 | 14 | 95 | 1 11/16 | 1 | 1-3 | ¼-1 | 1/16-1/8 | 9 |
| Plymouth PJ & PJ* DeL. 1935 | 6-3 1/16x4 3/16 | .011 | 6A | 2½A | .006H | .008H | A | AC-K9 | .025 | 4A | 1½A | .020 | Au. | 5 | 15 | 114 | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/8 | 8½ |
| Plymouth P1 1936 | 6-3 1/16x4 3/16 | .011 | 6A | 2½A | .006H | .008H | A | AC-K9 | .025 | 4A | 1½A | .020 | Au. | 5 | 15 | 114 | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/8 | 9½ |
| Plymouth P2 1936 | 6-3 1/16x4 3/16 | .011 | 6A | 2½A | .006H | .008H | A | AC-K9 | .025 | 4A | 1½A | .020 | Au. | 5 | 15 | 114 | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/8 | 9½ |
| Plymouth P3 1937 | 6-3 1/16x4 3/16 | .011 | 6A | 2½A | .006H | .008H | A | Ch-J8 | .025 | 4A | 1½A | .020 | Au. | 5 | 15 | 145† | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/8 | 4½-6½ |
| Plymouth P4 1937 | 6-3 1/16x4 3/16 | .011 | 6A | 2½A | .006H | .008H | A | Ch-J8 | .025 | 4A | 1½A | .020 | Au. | 5 | 15 | 145† | 1 11/16 | 1 | 1-3 | ¼-¾ | 0-1/8 | 4½-6½ |
| Pontiac 192930, 31 | 6-3 1/16x3 7/16 | .008 | 7A | 2¼A | .008H | .008H | A | AC-G14 | .025 | 4B | 1B | .020 | Au. | 6 | 13 | 74 | 2 | 1 1/16 | 1½-2¼E | 1½ | 0-1/8 | 7½ |
| Pontiac 402 1932 | 6-3 1/16x3 7/16 | .010 | TC | TC | .010H | .010H | A | AC-K12 | .022 | 8B | 3B | .022 | Au. | 6 | 14 | 74 | 2 | 1 1/16 | ..... | ..... | ..... | ..... |
| Pontiac 302-V8 1932 | 8-3 1/16x3 3/16 | .015 | TC | TC | .012H | .012H | A | AC-K12 | .022 | 11B | 4½B | .016 | Au. | 7 | 25 | 80 | 2¼ | 2 1/16 | 1½-2½E | 1¾ | 0-1/8 | 9½ |
| Pontiac 601 1933 | 8-3 1/16x3 1/2 | .012 | 5B | 2B | .010H | .010H | A | AC-K9 | .025 | 6½B | 2½B | .017 | Au. | 7 | 15 | 93 | 2 | 1 1/16 | 1½-2½E | 1½ | 1/16-1/8 | 7½ |
| Pontiac 603 1934 | 8-3 1/16x3 1/2 | .012 | 5B | 2B | .010H | .010H | A | AC-K9 | .025 | 6½B | 2½B | .018 | Au. | 7 | 15 | 103 | 2 | 1 1/16 | ½N-½P | 1-2 | 1/8-1/8 | 7 |
| Pontiac 701-Standard 1935 | 6-3 5/16x3 7/8 | .010 | 5B | 2B | .010H | .010H | A | AC-K7 | .025 | 4B | 1½B | .020 | Au. | 6 | 13½ | 103 | 2 | 1 1/16 | 0-E | 1-2 | 0-1/16 | 7 |
| Pontiac 701-DeLuxe 1935 | 6-3 5/16x3 7/8 | .010 | 5B | 2B | .010H | .010H | A | AC-K7 | .025 | 4B | 1½B | .020 | Au. | 6 | 13½ | 103 | 2 | 1 1/16 | 0-E | 1-2 | 0-1/16 | 7 |
| Pontiac 605 1935 | 8-3 1/16x3 1/2 | .010 | 5B | 2B | .010H | .010H | A | AC-K7 | .025 | 4B | 1½B | .018 | Au. | 7 | 14 | 103 | 2 | 1 1/16 | 0-E | 1-2 | 0-1/16 | 7 |
| Pontiac Master Six 1936 | 6-3 5/16x3 7/8 | .010 | 5B | 2B | .010H | .010H | A | AC-K7 | .025 | 4B | 1½B | .020 | Au. | 6 | 15 | 149 | 2 | 1 1/16 | 0-1½ | 1½-1¾ | 0-1/16 | 7½ |
| Pontiac DeLuxe Six 1936 | 6-3 5/16x3 7/8 | .010 | 5B | 2B | .010H | .010H | A | AC-K7 | .025 | 4B | 1½B | .020 | Au. | 6 | 15 | 149 | 2 | 1 1/16 | 0 | ½N-½P | 0-1/16 | 8¾ |
| Pontiac Eight 1936 | 8-3 1/4x3 1/2 | .010 | 5B | 2B | .010H | .010H | A | AC-K7 | .025 | 4B | 1½B | .018 | Au. | 7 | 16¾ | 144 | 2 | 1 1/16 | 0 | ½N-½P | 0-1/16 | 8¾ |
| Pontiac DeLuxe 37-26CA 1937 | 6-3 1/16x4 | .015 | 5B | 2B | .012H | .012H | A | AC-K7 | .025 | 4B | 1½B | .020 | Au. | 6 | 16 | 141† | 2 | 1 1/16 | ¾N-1¼N | ¾-1¼ | 0 | 4½-6 |
| Pontiac DeLuxe 37-28CA 1937 | 8-3 1/4x3 3/4 | .015 | 5B | 2B | .012H | .012H | A | AC-K7 | .025 | 4B | 1½B | .018 | Au. | 7 | 19 | 141† | 2 | 1 1/16 | ¾N-1¼N | ¾-1¼ | 0 | 4½-6 |
| [13]Reo B-Fly. Cld. & Mate. 1[r] 29-30 | 6-3 5/8x4 | .008 | 5A | 1¼A | .005H | .007H | A | Ch-C7 | .025 | 5B | 1¾B | .018 | A. | 5 | 14 | 72 | 1 7/16 | 1 1/16 | 2L[8] | 1½ | 1/8 | 7 |
| [13]Reo B-Fly. Cld. & Mate 1929-30 | 6-3 5/8x4 | .012 | 5A | 1¼A | .007H | .007H | A | Ch-C7 | .025 | 5B | 1¾B | .018 | A. | 5 | 14 | 72 | 2 1/16 | 1 1/16 | 2L[8] | 1½ | 1/8 | 8 |
| [13]Reo C-Fly. Cld. Master. 1929-30 | 6-3 1/4x5 1/16 | .008 | TC | TC | .005H | .007H | B | Ch-C7 | .026 | 7¼B | 2¼B | .018 | A. | 6 | 19 | 72 | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| [13]Reo C-Fly. Cld. Master. 1929-30 | 6-3 5/8x5 1/16 | .012 | TC | TC | .007H | .008H | B | Ch-C7 | .026 | 7¼B | 2¼B | .018 | A. | 6 | 19 | 88½ | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 20-Flying Cloud 1930 | 6-3 5/8x5 | .012 | TC | TC | .007H | .007H | B | Ch-C7 | .025 | 7¼B | 2¼B | .020 | A. | 6 | 19 | 88½ | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 25-Flying Cloud 1930 | 6-3 5/8x5 | .012 | TC | TC | .007H | .007H | B | Ch-C7 | .025 | 7¼B | 2¼B | .020 | A. | 6 | 19 | 84 | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 15 1930-31 | 6-3 5/8x4 | .012 | 5A | 1¼A | .007H | .007H | A | Ch-C7 | .025 | 5B | 1¼B | .020 | A. | 6 | 14 | 88 | 1 7/8 | 1 1/16 | 2L[8] | 1½ | 1/8 | 7 |
| Reo 25-Flying Cloud 1931 | 6-3 5/8x5 | .012 | TC | TC | .007H | .007H | B | Ch-C7 | .025 | 7¼B | 2¼B | .020 | A. | 6 | 17 | 84 | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 8-30-Fly.Cd.& 8-35 Roy. 1931 | 8-3 5/8x5 | .012 | TC | TC | .008H | .008H | (t) | Ch-C7 | .025 | 8¼B | 2¾B | .020 | A. | 8 | 23 | 84 | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 6-21 & 6-25-Fly.Cld. 1931-32 | 6-3 5/8x5 | .012 | TC | TC | .007H | .007H | B | Ch-C7 | .025 | 8B | 2¼B | .020 | A. | 6 | 19 | 84 | 2 1/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 8-21 & 8-25-Fly. Cld. 1931-32 | 8-3x4¾ | .012 | 4B | 1¼B | .007H | .007H | B | Ch-C7 | .025 | 5B | 1½B | .020 | A. | 8 | 16 | 85 | 2 3/16 | 1 1/16 | 3½L[8] | 1½ | 1/8 | 8 |
| Reo 8-31-Royale 1931-32 | 8-3 5/8x5 | .012 | TC | TC | .008H | .008H | B | Ch-C7 | .025 | 8¼B | 2¼B | .020 | A. | 8 | 23 | 84 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/16 | 8 |
| Reo S-Flying Cloud 1932 | 6-3 1/2x5 | .012 | TC | TC | .007H | .007H | B | Ch-C7 | .025 | 7¾B | 2½B | .020 | A. | 6 | 20 | 84 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/8 | 8 |
| Reo 8-35 & 8-52-Royale 1932 | 8-3 5/8x5 | .012 | TC | TC | .008H | .008H | B | Ch-C7 | .025 | 8¼B | 1¾B | .020 | A. | 8 | 23 | 84 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/8 | 8 |
| Reo S2-Flying Cloud 1933-34 | 6-3 5/8x5 | .012 | TC | TC | .007H | .007H | (t) | Ch-C7 | .025 | 6B | 2B | .020 | A. | 6 | 20 | 84 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/8 | 8 |
| Reo N1-Royale 1933-34 | 8-3 5/8x5 | .012 | TC | TC | .007H | .007H | (t) | Ch-C7 | .025 | 15A | ¾FM | .020 | A. | 8 | 25 | 84 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/8 | 8 |
| Reo N2-Royale 1933-34 | 8-3 5/8x5 | .012 | TC | TC | .007H | .007H | (t) | Ch-C7 | .025 | 15A | ¾FM | .020 | A. | 8 | 25 | 84 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/8 | 8 |
| Reo 4S-Flying Cloud 1934 | 6-3 5/8x5 | .012 | TC | TC | .007H | .007H | B | Ch-C7 | .025 | 6B | 2B | .020 | A. | 6 | 20 | 87 | 2 1/16 | 1 1/16 | 3½ | 1½ | 0-1/8 | 8 |
| Reo 5S & 7S-Royale 1935 | 6-3 5/8x5 | .012 | TC | TC | .007H | .008H | B | Ch-C7 | .025 | 6B | 2B | .020 | Au. | 6 | 20 | 87 | 2 1/16 | 1 1/16 | 4 | 1½ | 0-1/8 | 8 |
| Reo 6A-Flying Cloud 1935 | 6-2 11/16x4 3/4 | .012 | TC | TC | .007H | .008H | (t) | Ch-C7 | .025 | 12B | 5B | .020 | Au. | 6 | 18 | 90 | 2 1/16 | 1 1/16 | 1½ | 1½ | 0-1/8 | 8 |
| Reo Flying Cloud 1936 | 6-3 5/8x4 1/4 | .012 | 5B | 2B | .007H | .008H | (t) | Ch-C7A | .025 | 2B | ¾B | .020 | Au. | 6 | 18 | 85 | 2 1/16 | 1 1/16 | 1½ | 1½ | 1/8 | 8 |
| Rockne 65 1932 | 6-3 1/16x4 1/16 | .010 | 5B | 1½B | .004H | .006H | A | Ch-2 | .025 | 1½B | ⅛B | .020 | A. | 5 | 12 | 80 | 1 1/16 | 1¼ | ¼-¾E | 1½ | 1/16-1/8 | |
| Rockne 75 1932 | 6-2 7/8x4 1/16 | .010 | 5A | 1½A | .004H | .006H | A | Ch-2 | .025 | 5B | 1½B | .020 | A. | 7 | 14 | 76 | 2 1/16 | 1 1/16 | ¼-¾E | 0-1 | 1/16-1/8 | |
| Rockne 75 1932 | 6-3 1/4x4 1/16 | .010 | 5A | 1½A | .004H | .006H | A | Ch-2 | .025 | 5B | 1½B | .020 | A. | 7 | 14 | 76 | 2 1/16 | 1 1/16 | ¼-¾E | 0-1 | 1/16-1/8 | 8 |
| Rockne 10 1933 | 6-3 1/16x4 1/16 | .010 | 5B | 1½B | .004H | .006H | A | Ch-C7 | .025 | TC | TC | .020 | A. | 5 | 12 | 89 | 1 1/16 | 1¼ | ¼-¾E | 1½ | 1/16-1/8 | 9½ |

# Tune Up Specifications—(1928 to 1937 Inclusive)—Continued

| MAKE AND MODEL | No. of Cylinders and Bore and Stroke | VALVES: Inlet Tappet Clearance for Valve Timing | VALVES: Intake Valve Opens Before or After T. C. — No. of Degrees (E=Exhaust Valve) | VALVES: Intake Valve Opens Before or After T. C. — No. of Flywheel Teeth (E=Exhaust Valve) | VALVES: Operating Tappet Clearance — Intake | VALVES: Operating Tappet Clearance — Exhaust | Rods Removed from | IGNITION: Spark Plug — Make and Model | IGNITION: Spark Plug — Gap | IGNITION: Timing (1000ths of Inch Indicates Piston Travel) — Spark Occurs °TC | IGNITION: Timing — No. of Flywheel Teeth Spark Occurs TC | IGNITION: Timing — Breaker Gap | IGNITION: Timing — Breaker Housing | Capacity Crank Case (Qts.) | Capacity Cooling System (Qts.) | Compression Pressure at Cranking Speed (Lbs.) (Standard Head) | CRANK-PIN: Diameter | CRANK-PIN: Length | FRONT AXLE: Caster (Degrees) | FRONT AXLE: Camber (Degrees) | FRONT AXLE: Toe-in (Inches) | FRONT AXLE: Kingpin Inclination (Degrees) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Studebaker GJ-Com.....1930 | 6-3⅜x4⅝ | .010 | 5A | 1½A | .004H | .006H | AB | Ch-2 | .025 | TC | TC | .020 | ⅛A | 8 | 17 | 72 | 2 | 1½ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker FD-Com.....1929-30 | 6-3 1/16x4¼ | .010 | TC | TC | .004H | .006H | A | Ch-2 | .025 | 7B | 2B | .021 | A | 6½ | 14 | 78 | 1⅞ | 1 1/16 | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studeb'r FE & FH-Pres...1929-30 | 8-3½x4⅜ | .010 | 5A | 1½A | .004H | .006H | A | Ch-2 | .026 | 8B | 2½B | .021 | A | 8 | 21 | 89 | 2¼ | 1⅜ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker GL-Dictator.....1930 | 6-3⅜x4⅛ | .010 | 5A | 1½A | .006H | .006H | AB | Ch-2 | .025 | TC | TC | .020 | ⅛A | 8 | 15 | 72 | 2⅛ | 1½ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Stud'r 6-53 & Dy.Ersk.53.1930-31 | 6-3¼x4⅛ | .010 | 5A | 1½A | .004H | .006H | AB | Ch-C4 | .025 | TC | TC | .020 | ⅛A | 8 | 12½ | 80 | 2⅛ | 1½ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker FC-Dictator..1930-31 | 8-3 1/16x3⅜ | .010 | TC | TC | .004H | .006H | A | Ch-2 | .025 | 9B | 2½B | .020 | A | 6½ | 15 | 76 | 1⅞ | 1 1/16 | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 6-54.....1931 | 6-3¼x4⅛ | .010 | 5A | 1½A | .004H | .006H | AB | Ch-2 | .025 | 5B | 1½B | .021 | A | 8 | 12½ | 80 | 2⅛ | 1½ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-61.....1931 | 8-3 1/16x3⅜ | .010 | TC | TC | .004H | .006H | A | Ch-2 | .025 | 9B | 2½B | .020 | A | 6½ | 18 | 76 | 1⅞ | 1 1/16 | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-70-Com.....1931 | 8-3 1/16x4¼ | .010 | 15B | 4¼B | .004H | .006H | A | Ch-2 | .025 | 7B | 2B | .020 | A | 6½ | 19 | 80 | 1⅞ | 1 1/16 | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-80-President..1931 | 8-3½x4⅜ | .010 | 5A | 1½A | .004H | .006H | A | Ch-2 | .025 | 8B | 2½B | .020 | A | 8 | 21 | 78 | 2¼ | 1¼ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-90-President..1931 | 8-3½x4⅜ | .010 | 5A | 1½A | .004H | .006H | A | Ch-2 | .025 | 8B | 2½B | .020 | A | 8 | 21 | 78 | 2¼ | 1¼ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 6-55.....1932 | 6-3¼x4⅝ | .010 | 5A | 1½A | .004H | .006H | B | Ch-2 | .025 | 5B | 1½B | .021 | A | 7 | 12½ | 76 | 2⅛ | 1½ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-62-Dictator....1932 | 8-3 1/16x3⅜ | .010 | TC | TC | .004H | .006H | A | Ch-2 | .025 | 9B | 2½B | .020 | A | 6½ | 14 | 76 | 1⅞ | 1 1/16 | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-71 Com.....1932 | 8-3 1/16x4¼ | .010 | 15B | 4¼B | .004H | .006H | A | Ch-2 | .025 | 9B | 2½B | .020 | A | 6½ | 16 | 89 | 1⅞ | 1 1/16 | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-91-President..1932 | 8-3½x4⅜ | .010 | 5A | 1½A | .004H | .006H | A | Ch-2 | .025 | 9B | 2¾B | .020 | A | 8 | 21 | 78 | 2¼ | 1¼ | ¼-¾E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 6-56.....1933 | 6-3¼x4⅝ | .010 | 5A | 1½A | .004H | .006H | B | Ch-8 | .025 | TC | TC | .020 | A | 7 | 14 | 89 | 2⅛ | 1½ | ½-1½E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-73-Com.....1933 | 8-3 1/16x4 | .010 | 15B | 4¼B | .004H | .006H | A | Ch-2 | .025 | 4B | 1¼B | .020 | A | 6½ | 16 | 98 | 1⅞ | 1 1/16 | ½-1½E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-82-President..1933 | 8-3 1/16x4¼ | .010 | 15B | 4¼B | .004H | .006H | A | Ch-8 | .025 | 4B | 1¼B | .020 | A | 6½ | 18 | 76 | 1⅞ | 1 1/16 | ½-1½E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 8-92-President..1933 | 8-3½x4⅜ | .010 | 5A | 1½A | .004H | .006H | A | Ch-8 | .025 | TC | TC | .020 | A | 8 | 23 | 76 | 2¼ | 1¼ | ½-1½E | 0-1 | 1/16-⅛ | 8 |
| Studebaker A-Dictator.....1934 | 6-3¼x4⅛ | .010 | 15B | 4¼B | .004H | .006H | A | Ch-7 | .025 | TC | TC | .020 | Au | 5 | 15.6 | 105 | 2 1/16 | 1⅜ | 1-1½E | 1½ | 1/16-⅛ | 9½ |
| Studebaker B-Commander...1934 | 8-3 1/16x3⅜ | .010 | 15B | 4¼B | .004H | .006H | A | Ch-7 | .025 | TC | TC | .020 | Au | 6½ | 18.4 | 105 | 1⅞ | 1⅜ | 1-1½E | 0-1 | 1/16-⅛ | 8 |
| Studebaker C-President.....1934 | 8-3 1/16x4¼ | .010 | 15B | 4¼B | .004H | .006H | A | Ch-7 | .025 | TC | TC | .020 | Au | 6½ | 18.4 | 105 | 1⅞ | 1⅜ | 1-1½E | 0-1 | 1/16-⅛ | 8 |
| Studebaker 1A & ZA-Dict....1935 | 6-3¼x4⅛ | .010 | 5B | 1½B | .004H | .006H | A | Ch-7 | .027 | TC | TC | .020 | Au | 5 | 16½ | 105 | 2 1/16 | 1⅜ | ½ | 1½ | 1/16-⅛ | 9½ |
| Studebaker 1B-Commander..1935 | 8-3 1/16x4¼ | .010 | 15B | 4B | .004H | .006H | A | Ch-8 | .025 | TC | TC | .020 | Au | 6½ | 21½ | 99 | 1⅞ | 1 1/16 | ½ | 1½ | 1/16-⅛ | 9½ |
| Studebaker [illegible] | 8-3 1/16x4¼ | .010 | 15B | 4B | .004H | .006H | A | Ch-8 | .025 | TC | TC | .020 | Au | 6½ | 21½ | 110 | 1⅞ | 1 1/16 | ½ | 1½ | 1/16-⅛ | 9½ |
| Stud[illegible]ictator 6.....1936 | 6-3¼x4⅜ | .020 | 15B | 1½VDM | .016C | .016C | A | Ch-8S | .025 | 2B | 1/16VDM | .020 | Au | 6 | 14 | 105 | 2 1/16 | 1⅜ | 1-1½ | 1½ | 1/16-⅛ | 9½ |
| Studebaker Dict. Plan.....1936 | 6-3¼x4⅜ | .020 | 15B | 1½VDM | .016C | .016C | A | Ch-8S | .025 | 2B | 1/16VDM | .020 | Au | 6 | 14 | 105 | 2 1/16 | 1⅜ | ¼N-¾P | 1½ | 1/16-⅛ | 9½ |
| Studebaker President 8.....1936 | 8-3 1/16x4¼ | .020 | 15B | 5⅛B | .016C | .016C | A | Ch-8S | .025 | TC | TC | .020 | Au | 8 | 17.6 | 105 | 1⅞ | 1 1/16 | ¼N-¾P | 1½ | 1/16-⅛ | 9½ |
| Studebaker Dictator 6.....1937 | 6-3¼x4⅜ | .020 | 15B | 5⅛B | .016C | .016C | A | Ch-8 | .025 | 2B | ¾B | .020 | Au | 5½ | 13 | 105 | 2 1/16 | 1⅜ | 1½ | 1½ | 1/16-⅛ | 9½ |
| Studebaker Dictator Pl. 6...1937 | 6-3¼x4⅜ | .020 | 15B | 5⅛B | .016C | .016C | A | Ch-8 | .025 | 2B | ¾B | .020 | Au | 5½ | 13 | 105 | 2 1/16 | 1⅜ | ¼N-½P | ½ | 1/16-⅛ | 5½ |
| Studebaker President.....1937 | 8-3 1/16x4¼ | .020 | 15B | 5½B | .016C | .016C | A | Ch-8 | .025 | TC | TC | .020 | Au | 8 | 15½ | ..... | 1⅞ | 1 1/16 | ¼N-½P | ½ | 1/16-⅛ | 5½ |
| Terraplane K.....1932 | 6-2 1/16x4¾ | .006 | 11B | 3¼B | .006H | .008H | B | AC-K9 | .025 | TC | TC | .020 | Au | 6 | 17 | 95 | 1⅛ | 1⅜ | 3E | 2 | 0-⅛ | 7 |
| Terraplane K.....1933 | 6-2 1/16x4¾ | .006 | 11B | 3¼B | .006H | .008H | B | AC-K9 | .025 | TC | TC | .020 | Au | 6½ | 12 | 95 | 1⅛ | 1⅜ | 3E | 2 | 0-⅛ | 7 |
| Terraplane KT.....1934 | 8-2 1/16x4½ | .006 | 11B | 3¼B | .006H | .008H | B | Ch-K9 | .025 | TC | TC | .020 | A | 8 | 16 | 95 | 1⅛ | 1⅜ | 2½-3½ | 2 | 0-⅛ | 7 |
| Terraplane K & KS.....1934 | 6-3x5 | .010 | 10½ | 3B | .006H | .008H | A | Ch-J7 | .022 | TC | TC | .020 | Au | 6 | 18 | 93 | 1⅛ | 1⅜ | 2½-3½ | 2 | 0-⅛ | 7 |
| Terraplane KU.....1934 | 6-3x5 | .010 | 10⅜B | 3¼B | .006H | .008H | A | Ch-J7 | .022 | TC | TC | .020 | A | 6 | 18 | 93 | 1⅛ | 1⅜ | 2½-3½ | 2 | 0-⅛ | 7 |
| Terrap. G-Spec.& GU-DeL...1935 | 6-3x5 | .010 | 10⅜B | 3¼B | .006H | .008H | A | Ch-J7 | .025 | TC | TC | .020 | Au | 6 | 18 | 103 | 1⅛ | 1⅜ | 3¼-3¾ | 1-1½ | ⅛ | 7 |
| Terraplane DeL. & Cust. 6..1936 | 6-3x5 | .010 | 10⅜B | 4B | .006H | .008H | A | Ch-J8 | .022 | TC | TC | .020 | Au | 6 | 13 | 99 | 1⅛ | 1⅜ | 3¼-4½ | 1-1½ | 0-⅛ | 7 |
| Terraplane DeLuxe & Super..1936 | 6-3x5 | .006H | 10⅜B | 4B | .008 | .010 | A | Ch-J8 | .022 | TC | TC | .020 | Au | 5 | 12½ | 80 | 1 1/16 | 1⅜ | 0-½ | 1-1½ | 0-⅛ | 7 |
| Viking V29 & V30.....1930 | 8-3⅜x3⅝ | .010 | 1½B | ½B | .008H | .010H | A | AC-G12 | .026 | 12½B | 3½B | .022 | A | 7 | 32 | 78 | 2 | 1⅜ | 3L[10] | 2 | ⅛ | 7 |
| Whippet 96A.....1929-30-31 | 4-3 1/16x4¾ | .008 | 7A | 1¾A | .004H | .006H | B | Ch-C4 | .025 | FM | FM | .020 | A | 5 | 11 | 87 | 1⅞ | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Whippet 98A.....1930-31 | 6-3 1/16x4¾ | .008 | 7A | 2A | .004H | .006H | A | Ch-C4 | .025 | 8B | 2¼B | .018 | A | 6 | 12½ | 79 | 1⅞ | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys 8-80.....1930 | 8-3 1/16x4 | .010 | TC | TC | .006H | .008H | A | Ch-8 | .025 | 6B | 1¾B | .018 | A | 8 | 20 | 82 | 2 1/16 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys 98B.....1930-31 | 6-3¼x3⅞ | .008 | 7B | 2B | .004H | .006H | A | Ch-C7 | .025 | TC | TC | .018 | A | 7 | 14 | 91 | 2 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys 97.....1931 | 6-3¼x3⅞ | .008 | 7B | 2B | .004H | .006H | A | Ch-C7 | .025 | TC | TC | .018 | A | 7 | 14 | 82 | 2 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys 98D.....1932 | 6-3¼x3⅞ | .008 | 7B | 2B | .004H | .006H | A | Ch-C7 | .025 | TC | TC | .018 | A | 7 | 14 | 82 | 2 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys 8-80D.....1931-32 | 8-3 1/16x4 | .010 | TC | TC | .006H | .008H | A | Ch-8 | .027 | 6B | 2B | .018 | A | 8 | 19½ | 82 | 2 1/16 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys 6-90.....1932 | 6-3¼x3⅞ | .008 | 7B | 2¼B | .004H | .006H | A | Ch-8 | .025 | TC | TC | .018 | A | 7 | 13½ | 82 | 2 | 1⅛ | 1-2 | 2 | 1/16-⅛ | 7½ |
| Willys 8-88.....1932 | 8-3 1/16x4 | .010 | TC | TC | .006H | .008H | A | Ch-8 | .027 | 6B | 2B | .018 | A | 8 | 19½ | 82 | 2 1/16 | 1⅛ | 1-2 | 2 | ⅛ | 7½ |
| Willys 6-90A.....1933 | 6-3¼x3⅞ | .008 | 7B | 2¼B | .004H | .006H | A | Ch-8 | .025 | TC | TC | .018 | A | 7 | 13½ | 82 | 2 | 1⅛ | 1-2 | 2 | 1/16-⅛ | 7½ |
| Willys 8-88A.....1933 | 8-3 1/16x4 | .010 | TC | TC | .006H | .008H | A | Ch-8 | .027 | 6B | 4¾B | .018 | A | 8 | 19½ | 82 | 2 1/16 | 1⅛ | 1-2 | 2 | ⅛ | 7½ |
| Willys 77.....1933-34-35 | 4-3 1/16x4⅜ | .010 | TC | TC | .004H | 006H | A | Ch-7 | .025 | 4B | 1B | .018 | Au | 4 | 9 | 83 | 1 1/16 | 1⅛ | 1-2 | 2 | 1/16-⅛ | 7½ |
| Willys 77.....1936 | 4-3 1/16x4⅜ | .010 | TC | TC | .004H | 006H | A | Ch-C7 | .025 | 5A | 2A | .018 | Au | 4 | 9 | 93 | 1 1/16 | 1⅛ | 1-2 | 2 | 1/32 | 7½ |
| Willys.....1937 | 4-3 1/16x4⅜ | .010 | TC | TC | .004H | .006H | A | Va-18mm | .025 | 4A | 1A | .018 | Au | 4 | 11 | 87 | 1 1/16 | 1 1/16 | 3 | 2 | 1/32 | 7½ |
| Willys-Knight 66A-Gr. 6..1928-29 | 6-3⅜x4¾ | SV | 10A | 3A | SV | SV | B | Ch-C4 | .025 | 12B | 4B | .018 | A | 8 | 21 | 76 | 2⅛ | 1½ | 1-2E | 2½ | ⅛ | 8 |
| Willys-Knight 70B.....1929-30 | 6-2 1/16x4⅜ | SV | 5A | 1¼A | SV | SV | B | Ch-C1 | .025 | 8B | 2¼B | .018 | A | 8 | 17 | 89 | 2 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys-Knight 66B.....1930-31 | 6-3⅜x4¾ | SV | 5A | 1½A | SV | SV | B | Ch-C4 | .025 | 16B | 5½B | .018 | A | 8 | 21 | 89 | 2⅛ | 1½ | 1-2E | 2½ | ⅛ | 8 |
| Willys-Knight 87.....1930-31 | 6-2 1/16x4⅜ | SV | TC | TC | SV | SV | B | Ch-C1 | .025 | 8B | 2¼B | .018 | A | 8 | 15 | 89 | 2 | 1⅛ | 1-2E | 2 | ⅛ | 7½ |
| Willys-Knight 66D.....1931 | 6-3⅜x4¾ | SV | TC | TC | SV | SV | B | Ch-C4 | .025 | 16B | 5B | .018 | A | 8 | 17½ | 89 | 2⅛ | 1½ | 1-2E | 2 | ⅛ | 7½ |
| Willys-Knight Silver Anniv...1932 | 6-3⅜x4¾ | SV | TC | TC | SV | SV | B | Ch-C4 | .025 | 16B | 5B | .018 | A | 8 | 17½ | 89 | 2⅛ | 1½ | 1-2 | 2 | ⅛ | 7½ |
| Willys-Knight 95-Anniv.....1932 | 6-2 1/16x4⅜ | SV | 10B | 3B | SV | SV | B | Ch-C1 | .027 | 11B | 3½B | .018 | A | 8 | 15½ | 89 | 2 | 1⅛ | 1-2 | 2 | ⅛ | 7½ |
| Willys-Knight 66E.....1933 | 6-3⅜x4¾ | SV | TC | TC | SV | SV | B | Ch-C4 | .025 | 16B | 5B | .018 | A | 8 | 20 | 89 | 2⅛ | 1½ | 1-2 | 2 | ⅛ | 7½ |

**ABBREVIATIONS:**

*—at 2800 RPM
°—others also
*—Denotes Indices or markings on Flywheel
†—At 1000 R.P.M
††—Before Engine No. 16E—19,140; After Engine No. 16E—19,140
(a)—1¾B before Engine No 9437; 2½B after Engine No. 9437
A—Advanced (Breaker housing)
A—Above (Pistons removed from)
AA—Automatic adjustment (Valves)
AB—Some above and some below
Ac—Air cooled
AC—AC Spark Plug Co.
Au—Automatic spark advance
(b)—Early Model 40—to Frame No 2783246-6°; Early Model 50—to Frame No. 2782638-7°; Early Model 60—to Frame No. 2789357-7°; Early Model 90—to Frame No. 2785549-7°
B—Below (Rods removed from)
BA—Below or above (Rods removed from)
(c)—2½-3E before Axle No. 3-27619; 1-2E after Axle No. 3-27619
CA—Champion or AC—optional
Ch—Champion Spark Plug Co.
CSM—Chain Sprocket markings only
(d)—10¼ before Axle No. 3-77619
(e)—1930-G10, 1931-G7
E—Exhaust Valve
(f)—To Engine No. C-16466
FM—Flywheel markings only
(g)—Before Engine No. CD-8200
(h)—Before Engine No. CD-13605—3¼ Teeth; After Engine No. CD-13605—7½ Teeth
(k)—With 622C dist. 9°B or 3¾ T.B.; With 644K—large dist. .004A
(l)—With Dist 622H—10°B or 4 T.B.; With Dist. 644K—TC and TC
(m)—Before Engine No. 11,216—Intake .007C, Exhaust .014C; After Engine No. 11.216—Intake .015C, Exhaust .017C
(n)—Before Chassis No. 885.001—.006; After Chassis No. 885,001—.010
N—Negative
O—Out only
(p)—Before Engine No. 512,738—.008H; After Engine No. 512,738—.010H
P—Positive
(r)—Remove head, heat pistons, remove pins. Remove 1-2-5 and 6 rods below, No. 3 and 4 remove below cold.
(s)—1928-1¼", 1929-1½"
SV—Sleeve type valves
(t)—Remove head, push piston up to remove pin, remove rod below
(u)—Above before Engine F-144025; Below after Engine F-144025
Va—Various
VDM—Vibration dampener marks to pointer on crankcase
1—Before Car Serial No. P-116SL
2—After Car Serial No. P-116SE
3—Loaded to 650 lbs.
4—Model 75—3¼ bore x 4" stroke
5—Loaded at 600 lbs.
6—Before Car No. 13,520; After Car No. 13,520
7—1931 and 1932—1¼" wide
8—With Distributors marked 1GM-4003A Engine timed at TC
9—Loaded at 800 lbs.
10—Loaded at 450 lbs.
11—Loaded at 750 lbs.
12—Before Engine No. 16E-19,140; After Engine No. 16E-19,140
13—Before Engine No. 22,491; After Engine No. 22.491
14—First 900 Engines 3¼ bore x 5 stroke; After first 900 Engines—3⅜ bore x 5 stroke

## *Is Detroit Unionized?*

(*Continued from page* 29)

signed up as a matter of self-protection to avoid persecution. Thus the uion roster was padded with names of conscripts who become deserters as soon as pressure was lifted.

In the Detroit area, the actual dues-paying membership of the UAW is believed to be only a fraction of the 200,000 claimed by officials. One observer thinks it is less than one-third this number. A rival union leader estimates the figure at less than 30,000.

Union members signed up under duress are quickly lost and it is reported that many who came in without coercion are finding monthly dues distasteful. Particularly are they scared away by talk of special assessments. Some workers have found that although their hourly wage rates have been raised by union agreements, their weekly pey checks are smaller due to reduction in hours. The General Motors settlement was far from an unalloyed union victory and many members are said to have been none too well pleased.

The UAW strike in Chrysler plants was called solely on the exclusive bargaining issue. The union's chances of gaining this end appear more slender each day. If its leaders come away from the conference with anything less, it will mean defeat however cleverly the compromise might be worded. Widespread dissatisfaction among its members is predicted. It could well prove to be a body blow to the union. In view of the time lost by the strikers, it would be a costly privilege even if they won, and no impartial observer can be found who will predict victory for the union.

These are some of the reasons why authorities believe that the union movement in the automobile industry is due to wane. Another reason is found in the inherent weakness of the industrial type of union. As Mr. Culver explains, the vertical union has within it the seed of its own defeat. It lacks the homogeneity necessary for success. Its membership is comprised of skilled, semi-skilled and unskilled workers. The first two classes form the big majority and often they constitute poor union material. This is particularly true in the automobile industry where the unskilled are the best paid workers of their class in the world. Except when stirred up by agitators, they are as a rule satisfied with pay and working conditions. It is difficult for union leaders to hold these workers in line. On the other hand, the skilled workers have little in common with the unskilled and have little to gain by joining with them.

NO STOPPING THEM

Spring's in the air! Pent-up energy lets go with a whoop as school doors open and Young America fills the streets. Watch out for them, going and coming. Your road is *their* road, too. Keep your brakes in extra good shape. If they're played out, reline with AMCO and stop safely—surely.

Amco BRAKE LINING

ASBESTOS MANUFACTURING CO., Huntington, Ind.

### Lubaid Demonstrators

The Lubaid Company of Milwaukee, Wisconsin, have equipped their representatives with a laboratory testing machine which they claim demonstrates that Lubaid increases the film strength of any good motor oil from 200 to 500% so that the oil will withstand a much greater load. The manufacturer claims Lubaid does not contain any ingredient that will harm the most delicate motor and that it has the flash, fire and viscosity of motor oils.

### Battery Booklet

A 24-page booklet on its line of batteries for trucks and buses has just been published by The B. F. Goodrich Co., Akron, Ohio. It can be obtained by fleet owners or independent owners upon request to the company. The volume covers batteries for trucks, buses, tractors, taxicabs, hearses and fire apparatus.

### New Ray-O-Vac Merchandiser

The Ray-O-Vac Co., Madison, Wis., has developed a new merchandiser for the convenient display and sale of their Long Life Flashlight Unit Cells. It is attractively finished in bright red, yellow and blue, and keeps the cells clean and undamaged, dispensing them readily. The dispenser is supplied free with each 48 unit cells.

## *J. Alex Sloan Dies*

J. Alex Sloan, auto racing promoter, died March 10 at Evanston following a short illness. Conducting auto races at state and county fairs and expositions since 1909 Sloan was a leader in independent auto racing promotional enterprises, and during 1936 he promoted 72 days of race meets in 50 cities throughout the United States.

Sloan ran races sanctioned by the International Motor Contest Association. He headed the American Booking Agency which is known throughout the amusement world. His business will be carried on under the direction of his son John.

Sloan was 57 at his death and was a native of Pittsburgh, Pa. He was a graduate of Ohio Wesleyan where he was a stellar football player. Following graduation he worked on various metropolitan newspapers, and was the ghost writer of the James J. Corbett "fight letters."

Among the many pilots Sloan built up to stardom included such drivers as Barney Oldfield, Tommy Milton, Billy Arnold, Leon Duray, Louis Disbrow and numerous others. Prior to the war Sloan conducted team racing, and by the end of the war he had a stable of 42 machines many of which were the fastest in the world.

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## *Lisle Pin Hole Hone*

Lisle Corp., 813 E. Main St., Clarinda, Iowa, has announced a new piston pin hole hone. It features a new low-cost abrasive which can be changed quickly without the use of tools, and can be used wet or dry. Equipped with an automatic take-up to keep abrasive smooth and tight, it has an expansion range from 0.730 in. to 1 3/32 in., with oversize shoes available to handle 0.710 in. to 1 7/16 in. A special introductory offer of a 30-day trial sale is being made, with a guarantee of satisfaction or money back. Free literature may be had by writing the manufacturer.

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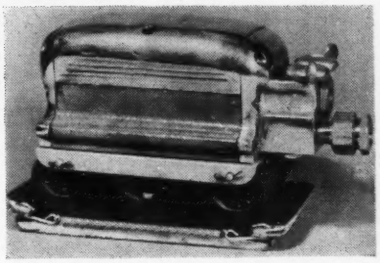
## *Air-Driven Sander Announced by Sterling*

The Sterling Products Co., 2457 Woodward Avenue, Detroit, Mich., has announced a new Speed-Bloc Sander, air-driven, which operates on 45 to 60 lb. air pressure and uses approximately 6 cu. ft. per minute under load. From one to five sheets of abrasives may be attached to the pad at one loading, and the construction of the bloc and pad provides flexibility for sanding and rubbing curved or flat surfaces. A water connection is provided for attaching a hose when the sander is used for wet work, with an



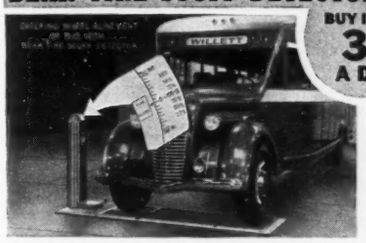
outlet on either side of the machine to direct the spray which is adjustable to the job requirements. Descriptive literature will be sent upon request.

## *Zaco 18 Concentrate For Better Tune-Up*

Zaco 18 Concentrate, a product of the Zip Abrasive Co., Washington and Center Streets, Cleveland, Ohio, is a new motor break-in concentrate that is said to free up sticking valves, double the film strength of oil, reduce friction and to practically eliminate burnt out bearings or scored cylinders on new or rebuilt motors. Zaco 18 is put up in 10 oz., 12 oz. and 16 oz. lithographed cans, and also in one and five gallon cans. Priced in single lots from 75c. for the 10-oz. can to $35 for the 5-gallon drum.


SERVICE SHOPS!
what are you waiting for?

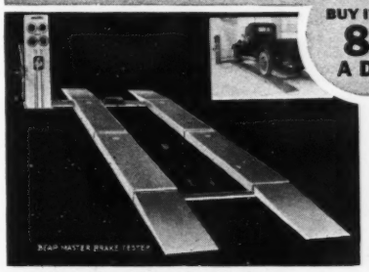
BEAR TIRE SCUFF DETECTOR
BUY IT FOR 33¢ A DAY



Requires only a few seconds to make an accurate test of front and rear wheel alinement under roadlike conditions. Shows in fractions exact condition of alinement and indicates tire wear in percentages.

Can't you afford 33¢ A DAY?

BEAR HYDRAULIC BRAKE TESTER
BUY IT FOR 86¢ A DAY



Quickly performs either drive-on or hook-up tests. Indicates brake drag, loose brakes, glazed linings and all other brake defects. Gives individual readings for each brake. A hydraulic tester built of genuine Lockheed parts.

BEAR HEADLIGHT TESTER
BUY IT FOR 9¢ A DAY

Quickly and accurately shows exact aim of the beam, high or low at 25 feet. Employs a new principle of trapping high and low rays with dual ray selectors and registering them on screen. Checks bulb in focus with reflector and bulb strength. Does not require an engineer to operate.

—to increase your SPRING CHECKUP PROFIT 30% from every customer!

Just 33¢ a Day—or LESS . . . on TERMS-TO-SUIT puts the BEAR TIRE SCUFF DETECTOR to work for you! A dramatic, convincing method of proving misalinement to car owners. Shows what misalined front and back wheels cost the car owner in wasted tire mileage. Sells wheel alinement jobs to 7 out of 10 cars which roll over it! Sells Safety on the basis of TIRE ECONOMY, a combination which can t be beat!

Get the details on this NEW BEAR TIRE SCUFF DETECTOR and other sales building Bear Equ'p-ment . . . Bear Hydraulic Brake Testers, Bear Headlight Testers, Bear Frame and Axle Straighteners, Bear Wheel Aliners, etc. All are available on LIBERAL PARTIAL PAYMENT PLANS to suit your requirements.

GET THE FACTS about Bear's new advertising program to help build more sales and profits for users of Bear Equipment. An unprecedented program which dr'ves home to your customers: TWICE A YEAR, HAVE YOUR WHEELS, BRAKES, HEADLIGHTS TESTED or your Car isn't Safe to Drive!

FREE TO SERVICE SHOPS
*complete catalog of Bear Testing and Correction Equipment and details of LIBERAL PARTIAL PAYMENT PLAN.*

BEAR Safety Equipment
BEAR MFG. CO., ROCK ISLAND, ILL.

### *Adjusting Ford Brakes*

(*Continued from page 24*)

that it is tight. Then back off on adjustment D, remove brake drum, remove shim stock and then replace drum. Repeat on all wheels. A brake concentricity gage or dummy drum used in place of the shim stock will greatly facilitate this operation.

Next check position of brake cross shaft operating levers. The front brake operating lever should be resting against the bottom of the cross shaft bracket. If not, pedal to cross shaft rod clevis should be adjusted accordingly. Then run adjusting screw at operating wedge D in until shoes are tight in drums. Adjust each cable clevis so that pin can just be installed with the cables pulled. Ford recommends a 25 lb. pull on the cables and has equipment for measuring the pull.

After installing all pull rod clevis pins, back off on adjusting screw D until drag is removed. Repeat operation on all wheels. Then apply the hand brake to first notch, and check wheels for even drag. Back off on tight wheels until all are equal.

### *Safety Program Reduced Death Rates In 8 Cities*

Estimates of the National Safety Council showing a total of 38,500 traffic deaths in 1936, an increase of 4 per cent, or 1500 over the previous year's total, accompany a new all-time high of 28,000,000 vehicles registered, a new record of 45,000,000 drivers, and an 11 per cent gain in car mileage over 1935, it was said by Paul G. Hoffman, chairman of the Automobile Manufacturers Association Safety Traffic Committee, and president of the Studebaker Corp.

"In the face of these unprecedented gains in vehicle registration and use," Mr. Hoffman continued, "19 states made material reductions in their highway deaths as compared with 1935. At the same time, eight of the thirteen U. S. cities of more than a half million population, finished the year with fewer traffic deaths.

"The Safety Council's figures showing a total of 111,000 accidental deaths in 1936 indicate that the best showing in the four principal categories was made by motor traffic with a 4 per cent increase. Accidental deaths in homes totaling 39,000, increased 24 per cent in 1936, while occupational accidents gained 9 per cent in fatalities and miscellaneous accidental deaths rose 6 per cent."

### *78% More Planes Built*

An increase of approximately 78 per cent in the total number of airplanes manufactured in the United States in 1936, and of 66 per cent in the number of light airplanes of the private owner type, is shown in aircraft production figures for the year made public by the Bureau of Air Commerce, Department of Commerce.

The total of all aircraft produced was 3006 in 1936 as against 1691 for 1935. The increase is particularly noticeable in small civilian airplanes of the types suitable for private owners. The greatest increase in this classification occurred in the number of two-place cabin land monoplanes produced. In 1935 there were 458 manufactured while 938 were constructed in 1936. The number of three-place cabin land monoplanes increased from 83 in 1935 to 96 in 1936.

Of the total 1936 production, 1637 aircraft were for domestic civil use, 858 were for delivery to military establishments, and 511 were exported.

The industry produced 1433 monoplanes and 204 biplanes. There were 131 companies or individuals producing airplanes for domestic civil use during 1936. Of these, 14 companies manufactured 20 or more planes each or approximately 90 per cent of the total for domestic civil use; 15 companies built 2 to 14 planes each, and 102 companies or individuals produced only one each or approximately 6 per cent of the total produced for domestic civil use.

**Cable Catalog Available**

The Crescent Co., Pawtucket, R. I., manufacturers of popular Wiry Joe atomotive cables, has just issued an attractive catalog featuring the full line. This new enlarged catalog No. 103 includes much information useful to the servicemen and has a handy wiring chart which shows clearly the proper wire to use for each automotive requirement. Copies of the new catalog are available free through jobbers or direct from the manufacturer.

**New Motorola Catalog**

The Galvin Manufacturing Corporation, 847 West Harrison St., Chicago, Ill., announce their new 1937 Motorola Catalogue containing specifications and descriptions of the five current models now in production. Prices range from $29.95 to $69.50. Motorola Model "35" — Price $29.95 is shown below.

**Arvin Sales Manual**

Noblitt-Sparks Industries, Inc., of Columbus, Indiana, makers of Arvin car radios, has recently announced a new Sales Manual containing a complete description of the line and of their Tailor-Fit instrument panel controls. It also contains an outline of selling helps available.

## Wake Up Service $

*(Continued from page 19)*

such as polishing or a fender straightened, he can point that out with the suggestion that his particular shop makes a specialty of such work.

Once the car is in the shop the rest is easy. Sell the customer the work he has asked for and then, when the car is on the lift for lubrication or other work, it can be examined for additional work, parts or accessories that may be needed. Furthermore, the car should be driven a short distance by a mechanic to check its performance, steering, riding qualities and brakes. A report can then be made out and the customer called on the phone and the suggestion made that the additional work be done.

Spring service business can also be increased by checking up on all customers that have patronized the shop in the past. This can be done by direct mail or phone. In this connection, manufacturers, particularly those producing gas, lubricants, brake lining, wheel aligning and lubricating equipment, have prepared complete customer follow-up systems and direct mail pieces for service stations. These can be secured at practically cost price from the manufacturers whose goods you use. In addition, Motor Age will be glad to supply suggested letters designed specifically to Wake Up Service Dollars.

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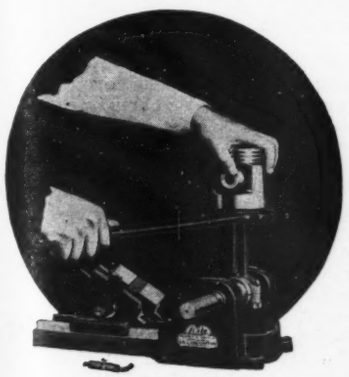
### *Aligns Connecting Rod*

The Lisle Corp., 813 East Main St., Clarinda, Iowa, has developed a connecting rod aligner which detects twists or bends from one position without removing the piston or removing the rod from the aligner. All rods up to 15 in. long can be handled on this machine, the cradle moving backward and forward on a slide and being adjustable to any length rod. Complete information will be supplied by the manufacturer upon request.



### *England to Regulate Tourist Trailer Camps*

An act restricting the freedom of camping and caravaning has been passed in England. After October it will be necessary for public sites to be licensed by local authorities; farmers also will have to obtain licenses if they wish to allow more than one caravan at a time to rent parking space.

This legislation is aimed at suppressing the many over-crowded, untidy and unhygienic camping and caravaning grounds that have sprung up all around the coast and in many rural areas during the past two or three years, the majority of them having no proper water or sanitary arrangements.

It has also been decided to recognize certain touring, camping and caravaning clubs as suitable authorities to approve or disapprove of sites, independently or in collaboration with local authorities.

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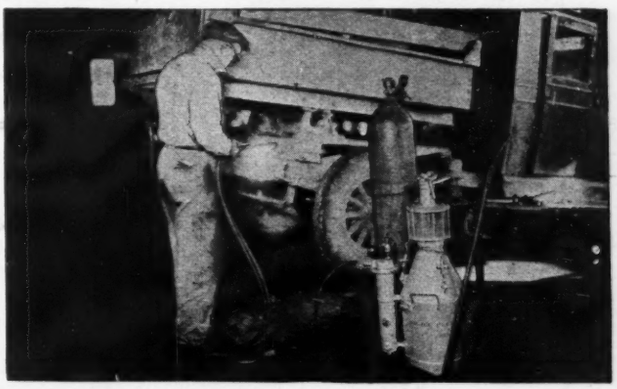
**New Headquarters**

Philadelphia Automobile Trade Association moved into its new headquarters in the west half of the eighth floor of the Inquirer Building, 400 N. Broad Street, Philadelphia, recently.


LOWER COSTS mean GREATER PROFITS



Good Equipment *brings* business . . . . Good Workmanship *keeps it* . . . . and Good Business *demands* that you use a

**SIGHT FEED ACETYLENE GENERATOR**

Today, wherever metals are fabricated or repaired, welding is done—and, except for production and very heavy jobs, it is usually done less expensively by the oxy-acetylene method.

The owner of a garage pays no more for his acetylene than does the largest factory—if he uses a SIGHT FEED—usually only about 1/3 the cost of dissolved (tank) acetylene.

In addition, the user of a SIGHT FEED has better gas . . . is able to do better work . . . can weld or cut faster . . . can use any make or type of torch . . . and SIGHT FEEDS are simpler and safer.

There are five sizes of SIGHT FEEDS, with capacities from 30 to 500 cubic feet per charge—which meet the requirements of practically every shop or plant.

*Ask your jobber, or write:*

**THE SIGHT FEED GENERATOR COMPANY**
**RICHMOND . . . . . INDIANA**

Sold on Convenient Terms under the Commercial Credit Company Plan

# Flex-Head

**PADDED FEET FOR BODY TOOLS**

**. . . DO NOT DENT, SCRATCH OR MAR BODY SURFACES**

Smooth workers, these new "Flex-Heads." Reshape doors, window frames, fenders and body sections—without marring surface or flattening out moldings. "Flex-Heads" are made of special resilient compound — conform to any contour — grip at an angle without slipping — and transmit tons of pressure over wide area without injury to part worked on. No need to shape wooden blocks or follow up with reworking or refinishing.

"Flex-Heads" are vulcanized to forged steel insert with 1¼" standard pipe thread for use with Blackhawk Porto-Power ram and extensions — or ordinary mechanical body jacks. These great time savers and money makers come in two practical sizes — the Z-131 (5-inch dia.) and Z-128 (3¼-inch dia.). Two of each size required for all around shop use.

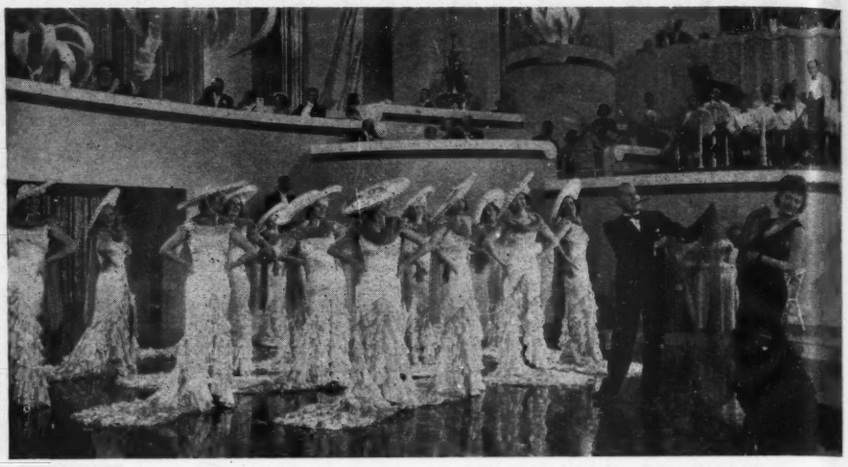
Ask your jobber salesman for S-69 assortment — or write for literature.

**BLACKHAWK MFG. CO.**

Milwaukee, Wisconsin

SEE OPPOSITE PAGE

**BLACKHAWK**

**Wake Up and Live** When 20th Century-Fox Pictures learned that Motor Age was planning a "Wake Up" production of its own ("Wake Up The Spring Market," etc.), they sent us a classy selection of photos from the Winchell-Bernie movie, just released. Above shot shows the Old Maestro and all the gals

### *Philadelphia Servicemen Choose New Officers*

At the annual meeting of the Automotive Service Assn. of Phila. the following officers were elected for the year of 1937: President, F. C. Nicholson; 1st vice-president, S. H. Neal, Jr.; 2nd vice-president, August Wilkening; treasurer, Jos. C. Dawson; secretary, W. P. Berrien. Directors: R. H. Erny, Ellwood E. Kieser, "Jack" Moss, Earl Mylecraine, John L. Palmer, Wm. E. Schwarze, Jr., A. G. Eckenhoff, A. W. Williamson. William P. "Bill" Berrien is executive secretary. Admissions Committee: Jos. C. Dawson, R. H. Erny, F. C. Nicholson.

### *New Company Formed to Make Varied Automotive Devices*

Shaffer Automotive Products Co. has been incorporated in the state of Ohio for the purpose of manufacturing a line of automotive products, including trailer couplings, safety and signal devices, clutches, transmissions, etc., all of which will be marketed under the trade name Apco. E. R. Shaffer is president and general manager; Frank C. Reynolds, executive vice-president; W. D. Lacock, treasurer, and Leo F. Ey, secretary.

The first article to be placed on the market will be a trailer coupling and automatic brake control.

## *Information Sought on Mattson Kidnapper*

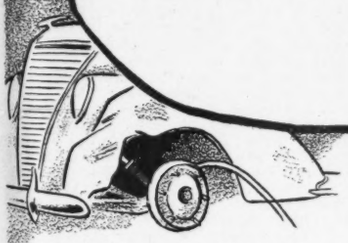
On Jan. 12, 1937, Homer S. Cummings, Attorney General of the United States, under authority vested in him by an Act of Congress, offered a reward of $10,000 for information furnished to a representative of the Federal Bureau of Investigation, United States Department of Justice, leading to the identification and apprehension of the person or persons responsible for the kidnapping on Dec. 27, 1936, and subsequent murder of Charles Fletcher Mattson, 10-year-old son of Dr. and Mrs. W. W. Mattson of Tacoma, Wash.

Shown here are two views of an artist's drawing which has been made from oral descriptions of the kidnapper as furnished by the children who were at the home of Dr. Mattson at the time of the abduction. The person who kidnapped Charles F. Mattson from the residence of his parents is described as follows: Age, about 30 years; height, 5 ft. 7 or 8 in.; weight, 145 to 165 lb.; complexion, swarthy; speech, slightly foreign accent; spoke brokenly; appeared to be of Southern European extraction. Peculiarities—did not stand erect; dimple in chin; high cheek bones; nose appeared to be broken a little below center; had hairy hands.

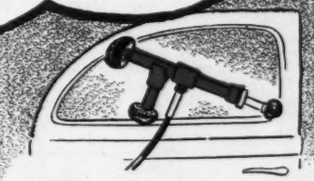
A bulletin signed by J. Edgar Hoover, director of the F.B.I., requests that if you are in possession of any information concerning the identity or whereabouts of the perpetrators of this offense, communicate immediately by telephone or telegraph, collect, with the nearest division of the Federal Bureau of Investigation.

# "Two Years Old. and haven't been stumped yet!"

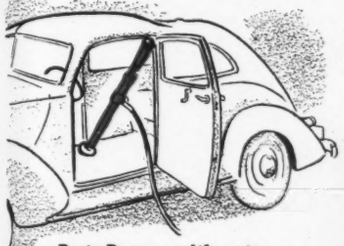
says **Porto-Power**



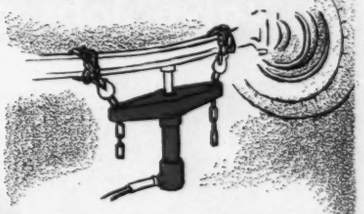
Quick set-ups iron out crumpled or bashed-in fenders in short order.



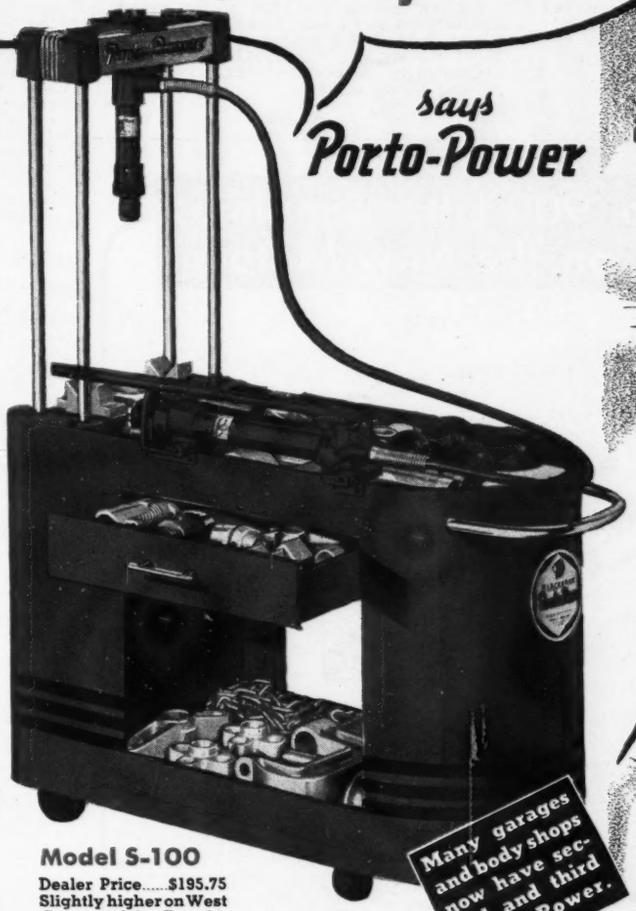
Door and window openings squared up. Here's where famous "Flex-Heads" strut their stuff.



Porto-Power, with extensions and attachments, handles scores of body and panel jobs.



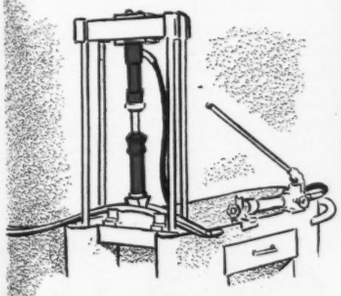
Porto-Power and Chain Pull Plate for axle-work and other bending or straightening jobs.



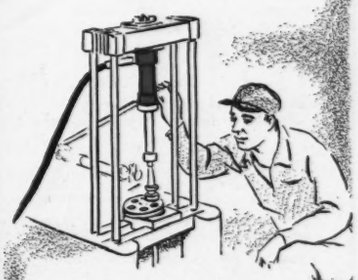
**Model S-100**

Dealer Price.....$195.75
Slightly higher on West Coast and in Canada.

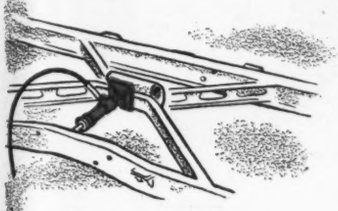
Many garages and body shops now have second and third Porto-Power.



Bumper work is "easy as pie" for Porto-Power.



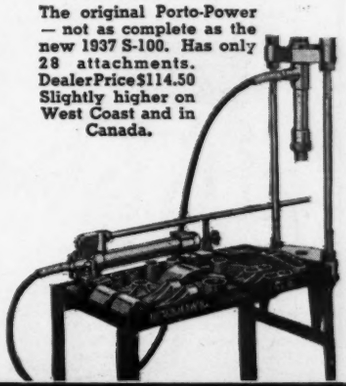
Big four-column press gives Porto-Power a remarkable range of shop uses.



Frames straightened and repaired easily—in many cases without need for "heat" or for removing body.

**Model S-50**

The original Porto-Power — not as complete as the new 1937 S-100. Has only 28 attachments. Dealer Price $114.50 Slightly higher on West Coast and in Canada.



THAT'S RIGHT!—Porto-Power celebrates its second birthday in April — and it has cleaned up on every job it has tackled. Cleaned up some handy profits, too — for thousands of garages, service stations, and repair shops throughout the country. By doing hundreds of different jobs better, quicker, and easier than they were ever done before. And to top all that — mechanics and repairmen are discovering many new uses for this remarkable work-shop-on-wheels—EVERY DAY!

*Ask your jobber salesman for demonstration — and send for free booklet "Crash Profits."*

**BLACKHAWK MFG. COMPANY**
Dept. MA-4 Milwaukee, Wisconsin

*Exclusive Canadian Distributor:*
**THE CANADIAN FAIRBANKS-MORSE CO., Limited**
*Branches in all Principal Cities*

See opposite page

BLACKHAWK Porto-Power

BLACKHAWK

Porto-Power

## *Midget Racing Circuit*

*(Continued from page 31)*

Entries already have been received from Bob Swanson, recognized world's champion; Ronney Householder, runner-up in the championship last season; Lou Schneider, winner of the 1931 Indianapolis "500" and third place winner in the world's midget championship in 1936; Frankie Bailey, 1936 Eastern AAA champion; Bob Sall, 1936 Southeastern AAA champion; Bill Schindler, winner of the national midget championship races held at the Boston Garden this winter; Dan Hogan, owner of the Madison Square Garden Special Offenhauser which gave such a good account of itself in the Vanderbilt Cup Race at Roosevelt Field in October, and many other leading small car drivers.

In the early spring of 1936, Stebbins completed plans to conduct midget race meets at Madison Square Garden Bowl. Not satisfied with the comparatively few first class midget cars in the East, he sent to the west coast and the middle west to recruit the best drivers and cars available. The result was that the opening of the Bowl found the greatest gathering of leading cars and drivers ever known to midget racing. The calibre of racing displayed at the Bowl attracted larger crowds than ever were known to midget racing, as many as 35,000 attending a single race meet. Ralph Hankinson, promoter, joined forces with Stebbins and raced the same cars at the Philadelphia Stadium, attracting large crowds throughout the season.

By the end of the 1936 racing season, Eastern drivers began building better and faster cars, all planning to race at the Bowl during the 1937 season instead of at tracks in an eastern circuit consisting of four meets a week.

Gradually during the early winter months this year Stebbins' idea of a big time midget circuit reached the ears of other promoters and the present loop was formed.

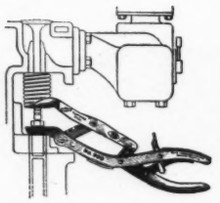
Drivers and car owners who intend to race in the circuit during the 1937 season will be issued regular permits to compete in the circuit and definite assignments will be given drivers This will eliminate the possibility of promoters finding themselves short of cars and drivers when the night of their meet rolls around. A set schedule of meets at which drivers will race also will allow promoters in the circuit to get out advance publicity concerning stars who will appear.

The forming of the circuit doubtless is the first step toward placing midget racing on a big time sports promotion basis. Officers of the circuit are: Walter C. Stebbins, of New York, president; Walter Secrist, of Philadelphia, vice-president; and William Heiserman, of Freeport, secretary-treasurer. The Board of Governors will consist of Harry J. Ryan, of New Haven (chairman); Walter C. Stebbins, Ralph A. Hankinson, William Heiserman, Walter Secrist, Frank Ferguson of New York, Douglas Yule of Boston, Frank Alden of Boston and John Fiddler of Reading.

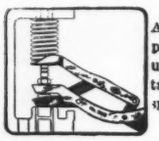

# New K-D No. 900 Lifter Simplifies Valve Jobs on the New Motors

"Hi-Offset" feature for motors with low hung manifolds and sweeping fenders. Total lift—3 inches.

Allows plenty of working space and clear view of valve when working under fender. Total length only 8¾ inches.



No. 900 in position on a Plymouth 1936 motor. Note generous working space and clear view of valve.



Auxiliary jaws swing into position for motors with unusual clearance between tappet housing and valve spring washer.

The new K-D No. 900 Lifter is the fastest Valve Lifter to satisfactorily service the new 1935, 1936 and 1937 Plymouth, Dodge, Dodge Truck, De Soto, Chrysler, Airstream and Airflow. Also Hudson, Oldsmobile, Pontiac, Studebaker, Terraplane, etc.

The unusually "Hi-Offset" jaws permit its operation on these motors **without removing the manifold** and unobstructed vision above the Lifter makes the handling of keepers faster and easier.

Remember the No. 900 will not service all makes of cars. No one Lifter will. K-D manufactures a number of Lifters, each best serving certain motor designs. You should own a set of K-D Lifters to fit the cars you service. **Send for Catalog.**

## K-D No. 10 Plier Set

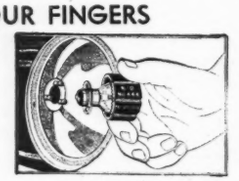
Forged and Tempered—For Ignition, Radio, Electrical, etc. Just the right size (4¼" long) for small work in those hard-to-get-at places. Milled Jaws, knurled handles, bright rustproof finish. Packed in handy steel kit, as shown, also in individual cartons.

## K-D No. 605

Valve Keeper Inserter with "easy loading feature" supports itself on the valve. Takes all sizes of split locks. Length 7 inches. Made of pressed steel.

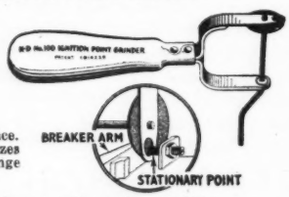
## PROTECT YOUR FINGERS

No. 444 Lamp Bulb Glove makes the removal and replacing any type Headlight Bulb safe from broken glass and cut hands. Motorists need one—so do you. Gloves furnished on attractive display cards to retail at 15¢ each.



## No. 100 Ignition Point Grinder

Grinds points accurately without removing them from distributor. Double faced grinding disc held parallel between the points by spring pressure of breaker arm. Both points ground at once. Discs made in two sizes to accommodate wide range of distributors.



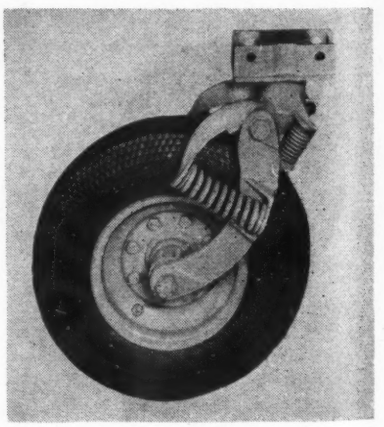

## No. 600 Lifter with Adjustable Parallel Jaws

Services practically all L-head motors, early models. A heavy-duty tool with offset jaws to work back of motor housing.

K-D MANUFACTURING CO.
Lancaster, Penna., U. S. A.


## *Third Wheel Trailer Knee Action Casters*

A new product of the Saginaw Stamping & Tool Co., Saginaw, Mich., is a third wheel knee action caster for trailer use. This caster makes the trailer self-contained when detached from the tractor, and eliminates the use of parking legs, jacks or other accessories. Its greatest feature, however, is that no load whatsoever is placed on the tow car so that it is no longer necessary to use heavy duty springs or special construction in the rear end to provide for the additional load of the trailer.



## *Mertens Tire Regroover*

A new tire regroover has been announced by Joseph Mertens, 2315 Spring St., Racine, Wis. Improves the appearance of used tires and is very valuable to the car dealer for the resale of used cars. Easy to operate, this electric gun controlled regroover is supplied complete with 12 adjustable diamond steel blades at a list price of $9.

# For 1937

A BRAND NEW SPARK PLUG LINE

# AC BLUE TOP

FOR PASSENGER CARS . . . BUSES . . . TRACTORS AND TRUCKS

## ● 27 TYPES

**replace the 82 types of the 1936 line!** Never before, such a complete line in so few types.

**The AC Blue Top line is a consolidation of the features of the 1936 AC Heat Range, Long Life, Tractor, and Universal lines—PLUS many new, thoroughly tested improvements.** Each plug is designed to the AC Heat Range, and to give full satisfaction in the most severe service its particular type and size will meet. Consequently, nearly every plug has individual features—not all of which can be seen.

**Improved design, superior quality, and the biggest advertising campaign in AC history** assure a big increase in demand for AC plugs.

With Blue Tops, you can service *all* engines—with a small stock investment—and get better turnover and more sales.

*NEW PRICES... NEW PROFITS TO THE DEALER... NEW LIST*

**65¢**

**THE AC BLUE TOP**

***constitutes the greatest opportunity the AC line ever offered!***

Order your assortment today—and start to collect Blue Top profit

The New Registered Station Sign also identifies you as a Blue Top dealer, and is featured in all AC advertising.

**AC SPARK PLUG DIVISION • *General Motors Corporation* • FLINT, MICHIGAN**

# Factory News

## *For Repairmen*

### Nash-Kelvinator Officers

At a meeting of the board of directors of Nash-Kelvinator Corporation held in Detroit last month the following officers were elected: C. W. Nash, chairman; G. W. Mason, president; H. G. Perkins, vice-president; C. H. Bliss, vice-president of sales, Nash Motor Division; N. Erik Walberg, vice-president of engineering, Nash Motor Division; H. W. Burritt, vice-president of sales, Kelvinator Division; R. B. Elliott, vice-president of production, Nash Motor Division; H. E. Long, vice-president of purchasing, Nash Motor Division; H. A. Lewis, treasurer; H. J. Mellum secretary; G. V. Egan, assistant secretary and assistant treasurer; G. H. Eddy, assistant treasurer; W. R. Crosett, Comptroller; L. J. Holly, assistant comptroller, Nash Motor Division; J. J. Timpy, assistant comptroller, Kelvinator Division.

### Bradley Heads Hupp

The board of directors of the Hupp Motor Corp. has announced that Thomas Bradley has been named president of the company. Mr. Bradley has had experience in the automobile industry dating back to 1911. At various times he served with the Paige-Detroit Motor Car Co. and Graham-Paige Motors Corp. in executive capacities. A new plan for refinancing the Hupp Motor Car Corp. and reopening its plant has been formulated by the board of directors and is to be submitted to a special stockholders' meeting convening at Richmond, Va., April 7, as MOTOR AGE went to press.

TURN RAIN DROPS INTO DOLLARS!

905 RUBBER DRIP MOULDING

The Champ-Items No. 905 Rubber Drip Moulding sells on sight! Stops rain dripping over door, soiling clothes and upholstery. Fits all cars and brings them up-to-date. Permanently installed without the use of tools. Blends gracefully with the contour of doors and enhances the car's appearance.

List $1.00 per pair

36" length for all 4-door cars. (46" for 2-door cars)

CHAMP-ITEMS

TRADE MARK REGISTERED

Order From Your Jobber

CHAMPION ANTI-RATTLER CO., Inc.

1935 Washington Ave., St. Louis, Mo.


### Keating and Lewellen Appointed

T. H. Keating, for the past three years Chevrolet Mid-West regional manager with headquarters in St. Louis, has been named to fill one of two new assistant sales managerships created by W. E. Holler, vice-president and general sales manager of Chevrolet. Mr. Keating and W. G. Lewellen, formerly director of mass selling in central office, will have charge of an entirely new national used car operation throughout the dealer organization. Mr. Keating is in charge of the eastern half of the United States and Mr. Lewellen, the western half.

### Larson Joins Burd Ring

H. I. Larson has joined the staff of the Burd Piston Ring Co., Rockford, Ill., as sales engineer, according to announcement by F. M. White, the company's president. Trained as an engineer at Armour Institute of Technology, Mr. Larson has since engaged in several phases of automotive engineering, with the last seven years in the piston ring industry.

### Institute Names Powers

The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio, sponsor of the $200,000 arc welding prize contest, announced the appointment, as assistant secretary, of Edmond C. Powers who has been engaged for three years in technical writing for The Lincoln Electric Company, Cleveland, Ohio.

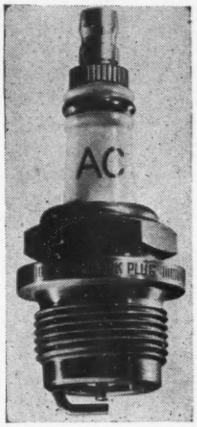
### Chevrolet Names Nine

Announcement of the appointment of nine new assistant regional managers in the sales organization of the Chevrolet Motor Division of the General Motors Sales Corporation was made by W. E. Holler, Chevrolet vice-president and general sales manager. Those named by Mr. Holler, and the regions to which they have been assigned, are: W. J. Graveson, Flint; G. R. Weeks, Atlantic Coast; F. W. Williams, Eastern; P. R. Letts, New England; W. J. Kane, Southeastern; R. W. Hill, Great Lakes; H. C. Howard, Southwestern; T. F. Brown, Middle Western; and F. N. Phelps, Pacific Coast. All were formerly zone managers.

### Covered Wagon Promotes Donaldson

A. G. Sherman, president of The Covered Wagon Company, Mt. Clemens, Mich., house trailer manufacturers, has announced the promotion of D. R. Donaldson to be vice-president in charge of manufacturing. Mr. Donaldson for the past two years had been factory manager of the trailer company.

## *AC Announces New "Blue Top" Spark Plugs*




A new line of AC spark plugs, known as the "Blue Top," was announced recently by the AC Spark Plug Division of General Motors. Features of the new plug are better service, better performance, better fuel economy and longer plug life. The new line contains only 27 types, as against the 82 types of the previous line. With the "Blue Top" line retailing at 65 cents each, AC also announced an improved and expanded line of Titan spark plugs to list at 40 cents each. This plug was designed for car owners who want better plugs at a price.

## *Hydraulic Jack Straightens Bodies*

A special hydraulic jack for straightening bodies and fenders, and for other operations requiring pressing, bending, pulling and pushing in connection with automobile repair work has been announced by the American Grinder & Specialty Corp., 112 S. Second St., Milwaukee, Wis. The "Hydrau-Kit" includes the hydraulic power unit and 26 attachments packed in a strong metal box, which makes it a valuable piece of shop equipment.

## *Security Record-Keeping Simplified By New Forms*

Under the Social Security Law, every employer, even if he has but a single employee, is required to set up and keep many new records. These records must be open for Government inspection at all times; they must conform to definite patterns established, and be so compiled that they are easily understood by both Government officials and the employer's personnel.

The Acme Card System Company, Chicago, Ill., has designed many Social Security record forms which are based on an analytical study of the law, conferences with Government officials and employees, the requirements of many companies which have already set up their record systems, and a wide experience based upon the development of over 200,000 visible record forms, to meet the requirements of over 80,000 different businesses. The Acme Card System Company has developed visible record equipment for the smallest as well as the largest organizations.

For the records of an employer having not more than 14 on the payroll, there is a visible-record book; for from 30 to 50 employees, a larger-sized binder of the same kind is available; for employers of 300 or more employees, tray cabinets of required capacity are available.

The most important of the forms is the Individual Payroll Record, which every business must keep no matter how small or how large. Among the other forms developed for Social Security Records are the Annual Payroll Summary, the Personnel Form, the Unemployment Tax Record and the Employees' Contribution Record.

The forms mentioned herein enable an employer to set up his record immediately, it is said, without any further investigation, analysis, or puzzling over the many requirements covered in the legal phraseology of the law.

# New Model New Features

HERE'S the new model of the famous Van Dorn Valve Reconditioning System which rolls right up to the car with all the latest equipment for fast, accurate valve-reconditioning. The big drawer at the top of the cabinet makes it easy to see and reach all the Vibro-Centric valve seat grinding stones, self-centering pilots and carbon-cleaning accessories; a hasp is provided so they can be locked up safely when not in use. The roomy lower storage bin, fully enclosed by doors in the front, has a hook for hanging the Vibro-Centric Driving Unit and plenty of space for storing other tools and equipment. A new adjustable lamp throws abundant light on the speedy, accurate Valve Refacer. Four built-in electric outlets are provided for lamps, tools, etc. See this new complete outfit at your jobber's — or write for details. The Van Dorn Electric Tool Co., 727 Joppa Road, Towson, Maryland.
(Div. of The Black & Decker Mfg. Co.)

NEW "Van Dorn"
VALVE RECONDITIONING SYSTEM

## *N.S.P.A. Committees*

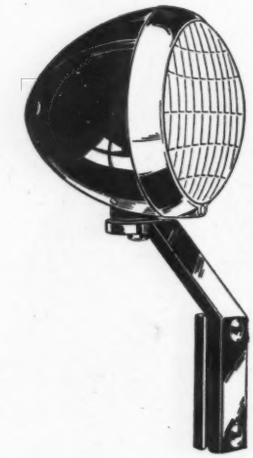
With all committee appointments for 1937 announced and accepted the N.S.P.A. administrative organization is complete.

At the top of the organization ladder under president Hunderup, senior vice-president V. C. Hossellman, Siferd-Hossellman Co., Lima, O., leads the wholesalers' division with L. G. Matthews, Sealed Power Corp., Muskegon, Mich., in charge of the manufacturers' division and chairman of the Manufacturers' Board of Governors. V. C. Anderson, Motor & Axle Parts Service, Inc., Chicago, Ill., is 1937 chairman of the Wholesalers' Board of Governors.

Committee appointments made by president Hunderup draw into active service 40 manufacturer and wholesaler members. Throughout, selections are representative of wholesalers in various parts of the country in both large and small trading areas, and manufacturers of parts, service tools, and shop equipment.

Heading important committees for 1937 are: Membership, M. F. Wible, Air-Land Motor Parts Co., Greensburg, Pa.; Marketing Research, R. L. Terry, United Wholesalers, Sioux City, Iowa; International Trade, Gordon Groth, the Simmons Mfg. Co., Ashland, Ohio; Trade Ethics, J. E. Adams, Toledo Steel Products Co., Toledo, Ohio; Legislative, L. H. Phelps, Phelps-Roberts Corp., Washington, D. C.

Personnel of the committees follows: Membership — Harry Reisser, Link-Belt Co., Indianapolis, Ind.; H. C. Holden, Holden-Wood, Inc., Miami, Fla.; C. F. Hodgson, Weaver Mfg. Co., Springfield, Ill.; P. J. Sawyer, Spencer-Smith Machine Co., Howell, Mich.; H. P. Bruhn, Buda Engine Parts, Inc., Denver, Colo. Marketing Research—L. F. Banigan, Edison-Splitdorf Corp., West Orange, N. J.; J. A. Keefe, Keefe Auto Supply Co., Billings, Mont.; Benton Forrest, Forrest Supply Co., Hutchinson, Kan.; A. W. Nathan, Detroit Supply Co., Inc., Albany, N. Y.; W. P. Nash, Automotive Supply Co., Inc., Visalia, Calif.; O. R. McDonald, Manley Mfg. Div., American Chain & Cable Co., Inc., York, Pa.; R. G. Patterson, Lamson & Sessions Co., Cleveland, Ohio; Vaughn J. Snively, McAleer Mfg. Co., Detroit, Mich.; S. M. Prior, Fafnir Bearing Co., New Britain, Conn.; J. E. O'Toole, Utica Drop Forge & Tool Corp., Utica, N. Y.; R. B. McClure, Parts Service Corp., Montgomery, Ala.; C. E. Prefontaine, United Auto Parts, Ltd., Montreal, P. Q. International Trade—J. F. Kelly, Jr., Electric Storage Battery Co., New York, N. Y.; C. C. Secrist, Victor Mfg. & Gasket Co., Chicago, Ill.; C. M. Wynne, Overseas Industries, Inc., Chicago, Ill.; A. A. Bellinger, Manley Mfg. Div., American Chain & Cable Co., Inc., York, Pa.; K. Nielsen, Belden Mfg. Co., Chicago, Ill.; G. E. Quisenberry, Business Publishers International Corp., New York, N. Y.; A. F. Houghton, American Automobile (Overseas Edition), New York, N. Y. Trade Ethics—H. A. Dunson, the Dunson Supply Co., Sidney, Ohio; F. M. Snyder, Sturgis AutoSupply Co., Sturgis, Mich. Legislative—T. L. Ford, American Hammered Piston Ring Div. of Koppers Co., Baltimore, Md.

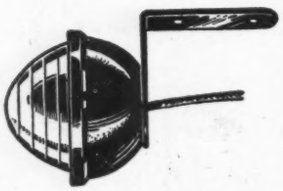



# ARROW SAFETY RIDES OUT THE FOG

**Blinding fog will never halt vehicles equipped with Arrow Fog Lamps. That's because Arrow lamps are not just gadgets.**

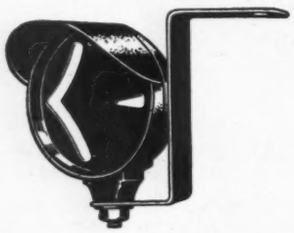
## BUILT FOR SERVICE

**When you examine the Arrow Fog Lamp you'll find Arrow Safety—the safety of your rolling stock—built into it. It's there in the rugged, heavy gauged metal used for shell and clamps, in the hardware and cables. For Arrow Safety demands unfailing dependability and long service.**



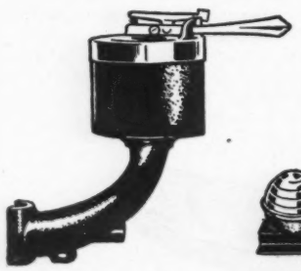
## ARROW'S COMPLETE LINE

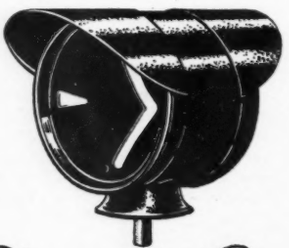
**The Arrow Directional Signal line is complete and legally approved. It includes one-way, two-way, flush, right-left, and combination types.**

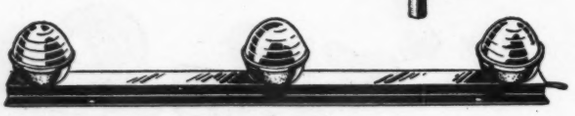


*Other Arrow products include Marker Lights, Flares, Highway Signals*

*Ask your jobber*







**ARROW SAFETY DEVICE CO., INC.**

MEDFORD, NEW JERSEY


### Fourth Soap Box Derby

For the fourth consecutive year, Chevrolet will cooperate with the leading newspapers of the country in sponsoring the All-American Soap Box Derby, which has been called "the greatest amateur racing event in the world." The derby started in Dayton, Ohio four years ago. Last year there were more than 150,000 boys competing in various cities throughout the United States. Champions from 116 cities took part in the national finals at Akron, Ohio.

### Lucky Used Car

One of the most satisfied used car purchasers in the country is undoubtedly Roy Koontz, of Bloomington, Ind., who recently bought a car from the local Chevrolet dealer. After driving it home he found a dime under a seat cushion. A second glance showed that it was coined in 1821 and, consulting a specialist, he learned that it is so rare as to have a current value of $450.

### New Emark House Organ

The first issue of "Battery Topics" has reached the trade. It is issued by Thomas A. Edison, Inc., through its Emark Battery Division, at Kearny, N. J. Featured in this issue are announcements of the New Emark High Capacity line and the new Endurite separator, also the news about its revised bus and truck battery line.

### Get Your Tune-Up Chart

Universal Chemists, Inc., 263 Northampton St., Boston, Mass., has developed a large wall chart covering important points to be checked for an engine tune-up, together with instructions covering the operations. They will send a copy to any repairman who will pay the postage.

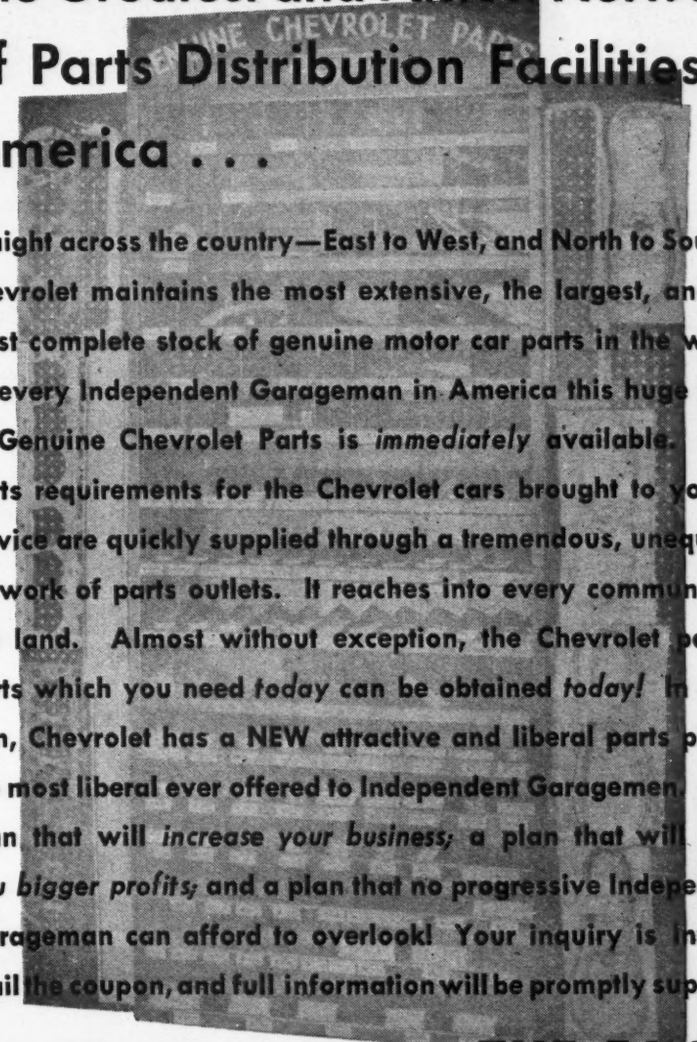
### Kreger Catalogs

A new and revised edition of Kreger Catalog Sheets has just been announced by Larry Kreger, of The L. F. Kreger Manufacturing Co., Chicago. A number of new items are listed in these sheets and are being announced in current Kreger mailings to the trade.

# At Your Service!

## INDEPENDENT GARAGEMEN

## The Greatest and Fastest Network of Parts Distribution Facilities in America . . .




**10,000 CHEVROLET DEALERS Extend This Cooperative SERVICE**

•

Through the operation of a highly developed Balanced Parts Stock Plan, Chevrolet dealers the country over are always in a position to supply you with the *right part at the right time!* Every Genuine Chevrolet Part . . . even the slowest moving items . . . can be quickly obtained through the fastest parts supply service ever developed. Scores of warehouses and instant teletype communication guarantee immediate action . . . shipment the same day.

•

*Write* for Details of the New Chevrolet Plan for Independent GARAGEMEN

CHEVROLET

CHEVROLET MOTOR DIVISION
*General Motors Sales Corporation*
DETROIT, MICHIGAN

Straight across the country—East to West, and North to South—Chevrolet maintains the most extensive, the largest, and the most complete stock of genuine motor car parts in the world. To every Independent Garageman in America this huge stock of Genuine Chevrolet Parts is *immediately* available. Your parts requirements for the Chevrolet cars brought to you for service are quickly supplied through a tremendous, unequaled network of parts outlets. It reaches into every community in the land. Almost without exception, the Chevrolet part or parts which you need *today* can be obtained *today!* In addition, Chevrolet has a NEW attractive and liberal parts plan—the most liberal ever offered to Independent Garagemen. It is a plan that will *increase your business;* a plan that will *make you bigger profits;* and a plan that no progressive Independent Garageman can afford to overlook! Your inquiry is invited. Mail the coupon, and full information will be promptly supplied.

## *This Coupon Will Bring* THE FACTS

CHEVROLET MOTOR DIVISION
*General Motors Sales Corporation*
Parts Merchandising Dept. 7 B-4
GENERAL MOTORS BLDG., DETROIT, MICH.

Gentlemen:

I am interested in the details of any proposition that will operate to increase the volume and profits gained from my business. Please send me, without obligation on my part, full information concerning the new 1937 Chevrolet Plan for Independent Garagemen.

Name_____ Street_____

City_____ State_____

PRICE
and QUALITY
appeal to the purchaser--
and HEIN-WERNER
offers Both....

The ever increasing demand for Hein-Werner Hydraulic Jacks definitely proves that it pays to push the sale of jacks that are *built right and priced right.*

Each model in this complete line has superior features that win instant and lasting favor . . . For example, take the H-W BUMPER-LIFT (illustrated at left). It handles 99 percent of all current passenger cars—quickly, easily and safely . . . Hooks under the bumper arm . . . No need to get on knees or crawl under car—motorist can stand up to position and operate this jack.

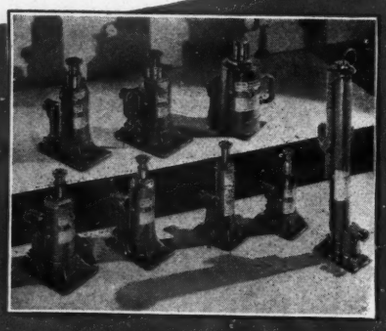
A few easy strokes on the handle of the Bumper-Lift raises tire from road or floor . . . Can be lowered and removed in 5 seconds . . . Capacity 1½ tons . . . Low 9½" . . . Extreme high 33¾" . . . Price to dealer, $4.95 (West Coast, $5.65).

Bumper-Lift
$4.95 NET TO DEALER

A Complete Line

Other models in this line include the "Bullet" Model, 1½ ton capacity at $2.99 (West Coast $3.30)... Light Truck Special, 2 ton model $4.25 (West Coast $4.70)... For other trucks—3 ton models at $7.65 (West Coast $8.20)... 5 ton $9.90 (West Coast $10.60)... 7 ton $13.15 (West Coast $14.25)... For heavy trucks, buses and shop use—12 ton models at $19.15 (West Coast $20.25)... 20 ton model $33.00 (West Coast $34.50)... All prices are net to dealer... Line also includes 5 Models of hydraulic service jacks.

HEIN-WERNER MOTOR PARTS CORP.
Waukesha, Wisconsin



FEW MODELS ENGINEERED TO DO THE WORK OF MANY
HEIN-WERNER hydraulic JACKS

## *New Brunner Manual*

Knowledge of the air requirements of modern profit-making pneumatic equipment, and the correct type of air compressor to meet these requirements, is essential for successful service in the opinion of B. J. Scholl, sales manager of the Brunner Manufacturing Company, Utica, N. Y.

Mr. Scholl points out that up-to-date, efficient equipment is a good advertisement, and one way of inducing the motorist to "follow suit" and rejuvenate his car.

The new Brunner Manual and Catalog No. 31 gives first hand information about compressed air—its many uses, types of compressors, air displacements, air flow, selecting proper equipment. Truly a treasure house of information. Request for the Brunner Manual and Catalog No. 31 should be sent to the Brunner Manufacturing Company, Utica, N. Y.

---

## *Rewarded for Safe Driving*

The equivalent of six times around the world without an accident is the 1936 record of six truck drivers of the AC Spark Plug division of General Motors. They drove 148,700 miles without an accident of any kind. In recognition of their outstanding feat, the drivers were presented with National Safety Council badges and identification cards by L. C. Goad, AC manufacturing manager, and Sergeant Cassinger of the Flint police traffic division. The men thus honored were, Richard Keyes, Laurence Hunter, Milo Jean, Hazen Lucier, Albert Blue and Roy Behrendt.

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## *To Collect Trailer Data*

The first automobile trailer canvass ever conducted by the Census Bureau will be started, it was announced last month by Director William L. Austin of the Bureau of the Census, Department of Commerce.

The census will cover factory sales of house trailers and semi-trailers; truck trailers and semi-trailers; and other types of passenger car trailers for the calendar year 1936. The number of sales will be recorded together with the net wholesale (f.o.b. factory) value based on prices charged to dealers, distributors and branch agencies.

---

## *United Motors Official To Address Credit Men*

A. W. Pfeiffer, assistant treasurer, United Motor Service, Detroit, co-chairman of the Petroleum and Automotive Supply Wholesalers Group, 42nd Annual Convention and Credit Congress of Industry, National Association of Credit Men, will address the convention which meets at Stevens Hotel, Chicago, June 21-24. Mr. Pfeiffer and other speakers will discuss problems facing the industry. Also co-chairman of the group is M. D. Fields, Central Rubber & Supply Co., Indianapolis. Vice-chairmen are: E. M. Palmer, Hinsdale Mfg. Co., Chicago, and W. C. Streffensmeyer, Sidles Co., Lincoln, Neb.

**COSTS LESS THAN ORDINARY SOLDERS**

GARDINER
SOLDER
The GARDINER Line of solders is complete for various uses. The quality is of the best. It includes Flux - Filled Solders, Solid Wire, Bar and Body Solders, also Permanent Lining Babbitt Metal. A 100% Service through jobbers.
Gardiner
METAL CO.

GARDINER METAL COMPANY
4839 S. Campbell Ave., Chicago, Ill.

**You Can Always Depend On**

**LION**
DEPENDABLE QUALITY

**For Guaranteed Auto Parts Supplies & Accessories**

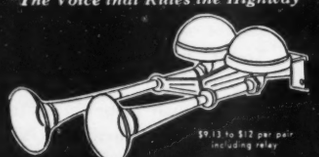
Radiator, battery repairing and all sorts of soldering jobs easily done with the

**TORIT**
**Acetylene Torch**
**No. 23**

Simply connect to Presto Tank. Includes a set of 4 tips. Price, $6.75.

TORIT MFG. CO.
290 Walnut St., St. Paul, Minn

**SPARTON ELECTRIC AIR-TONED HORNS**
*"The Voice that Rules the Highway"*



$9.13 to $12 per pair including relay

Powerful commanding Sparton Horns help make high speed driving safe. Write for Horn Catalogue and complete information.

THE SPARKS-WITHINGTON CO., Jackson, Michigan, U. S. A.

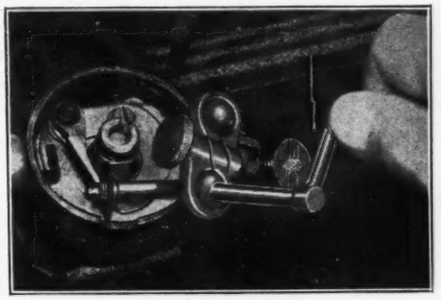

## *Fulton Offers New Type Tow-Bar*

The Fulton Co., 1912 S. 82nd Ave., Milwaukee, Wis., has introduced a new type tow-bar with malleable iron jaws which clamp to the bumpers, and which are fitted to a 40-in. steel pipe

tow-bar with ball and socket swivel joints. The rigid steel pipe maintains a fixed distance between the cars at all times, eliminating jerks when starting and stopping, and the swivel joints permit smooth and easy turning of the tow car and easy following of the car being towed, relieving the bumpers of all twisting strains. The weight of the tow-bar complete is 10 lb.

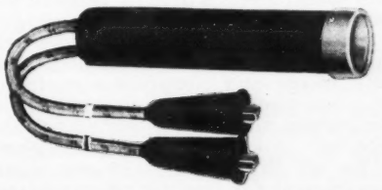
## *Ignition Point Dresser Works on the Car*

An ignition point dresser that attaches to the side of the distributor housing and dresses points without removing them from the plate has been developed by the Weaver Mfg. Co., 2177 S. Ninth St., Springfield, Ill. The dresser is supplied complete with six assorted abrasive disks.



## *Stromberg Timing Light*

A new ignition timing light has been developed by the Stromberg Motoscope Corp., 2701 Belmont Ave., Chicago, Ill. Made on the stroboscope principle, it



has a powerful concentrated light to show up the timing mark clearly. The ignition stroboscope is 1 5/16 in. in diameter, which makes it handy to use where space is limited. Priced at $3.90 f.o.b. Chicago, it is now possible for every mechanic to have his own timing light.

**Federal Appoints Turner**

The appointment of J. J. Turner as sales manager of the Trailer division of the Federal Motor Truck Company is announced by R. W. Ruddon, vice-president and general manager of Federal.


**DON'T LET THEM WORRY YOU**

**HOUSER'S BUG JUICE DISSOLVENT**
*Will Clean Them Off*

**Dried smashed bugs on a car don't just wash off — and cleaning them with an abrasive cleaner removes the finish along with the bugs. The labor required is costly.**

**Houser's Chemical Bug Juice Dissolvent melts away dried insect matter without injury to the finest finishes. It acts fast—requires little work. It makes wash jobs look perfect—and brings those repeats that mean money to you.**

**Get your trial package today—$1.00 Postpaid. Will clean 25 to 50 cars.**

**Guaranteed.**

THE HOUSER ENG. & MFG. CO.
BLUFFTON INDIANA

***Manufacturers of Brake Squeak Eliminators, Steering Stabilizers for knee-action cars, Dry Lubricant.***

**OUR RECORDS PROVE IT'S GOOD**

**FOR REPEAT ORDERS KEEP POURING IN**
*GET·YOURS·TODAY*

**Flint** Loss-Proof Compression SPARK PLUG!

The favorite replacement plug with leading garage and service stations because it produces maximum power not only in the older type of motors but also in the latest type of high-speed, high compression motors.

*Order from your jobber!*

*Write for literature!*

C. V. S. Manufacturing Co.

Flint, Michigan



**MASTER PAINT STRIPERS**

- Seven stripe widths—1/32" to 3/16"

**EASY TO USE**

Lays a perfect paint stripe on Autos—Trucks, etc. Stripes lend that "professional touch" to every paint job.

*"Eye Appeal Means Buy Appeal."*

Sets $1.50 to $8.50.

Ask your *jobber* or write us for literature.

**WENDELL MFG. CO.**

2533 N. ASHLAND AVE. CHICAGO, ILL.



● ***NEW - - -***

***IGNITION OSCILLOGRAPH***

**Using new scanning disc system FOR—Checking and adjusting all types ignition distributors.**

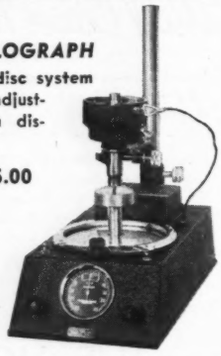
**COMPLETE—$85.00**

Other automotive instruments—$3.95 and up.

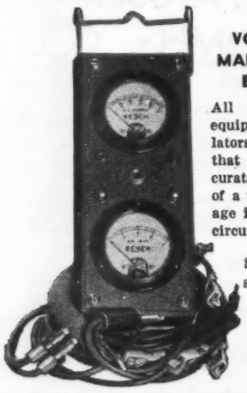
*WRITE*

**ADLER MFG. CO.**

North Chicago, Ill.







**BESCO VOLT AMP-TESTER MAKES ALL PRIMARY ELECTRIC TESTS**

All popular cars are equipped with voltage regulators and cut-out relays that must be adjusted accurately to within one-tenth of a volt. If generator voltage is too high all electrical circuits will be damaged.

Send for complete descriptive catalogue page.

**BESCO PRODUCTS, INC.**

**7524-30 Greenwood Ave., Chicago, Ill.**



***Master* WHEEL SPINNER *Control***

WRITE FOR PRICES AND CATALOG OF NEW ITEMS

*Berkson Products, Inc.*

AUTOMOTIVE SPECIALTIES

1801-1809 INDIANA AVE. • • CHICAGO, ILL.


## *Walker Merchandising*

**The keynote of the Walker Silencer merchandising program to help repairmen make extra sales and profits on the exhaust system is—"Look at all four when you tune up a car." Check: Ignition, carburetion, compression, exhaust system.**

The reason for this practice is—Widespread investigation has proved that 2 out of 3 cars have faulty exhaust systems. Authorities, governmental, as well as safety, are campaigning vigorously against this condition both from the standpoint of protection against carbon monoxide poisoning and improving motor efficiency. It's good business for repairmen to join this drive and include the exhaust system as a standard routine in the tune-up cycle.

The Walker merchandising program permits repairmen to capitalize on this drive with exhaust system inspection tags which makes it easy to check and record exhaust system defects. It promotes customer good will and makes him more conscious of the need for repair work. In addition, other material is available such as the Walker Silencer floor display stand and pipe stand which holds both exhaust and tail pipes. Complete information about the free material and how to get it may be obtained from a Walker jobber.

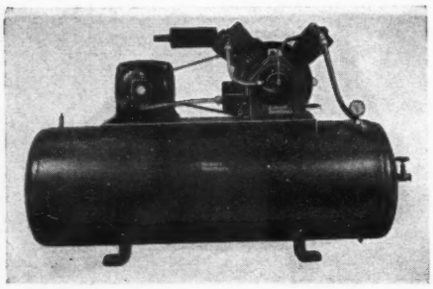
Walker Silencers with the patented louvered tube are a development of the Walker Manufacturing Company, Racine, Wisconsin, makers of Walker Jacks and Electric Lifts. They are supplied to the trade in a complete line of sizes including direct-flow, tri-flow, oval tri-flow and resonator types for replacement on cars, trucks and buses.

In addition to the Silencer models, Walker furnishes new 360° contact clamps. This Walker development consists of a U-bolt and saddle shaped to fit all around. It presses uniformly when tightened. This new clamp seals connections permanently —prevents dangerous carbon monoxide leaks—and makes joints rattleproof, it is said.

The Walker line also provides exhaust and tail pipes for Chevrolet, Ford and Plymouth, two sizes of adjustable tail pipes and other sizes for special applications on cars and trucks.

## *"V" Type Air Compressor*

Hobart Brothers, Hobart Square, Troy, Ohio, announce a new "V" Type or "Angle" Air Compressor. This unit they claim meets a definite demand today for a compressor developing higher pressures than 150 lb. There are five models of a self-contained type with motor and compressor mounted on a one-piece steel sub-base which is electrically welded to a horizontal air receiver. All are designed particularly for air lift operation or any other requirement for free air not exceeding 200 lb.




**THE 60 MINUTE WAY**

**ZECOL WAX** TO CAR BEAUTY

*REPEATS* — because it is attractively packaged—priced right—costs less to use—advertised—*PLUS*—superior quality and speed and ease of application. *Tie up with a winner*—write

**ZECOL, Inc., Milwaukee, Wis.**



**HACKETT *Universal* ROLLER**

**NOW IN BIG DEMAND**

New Type Universal Blade, fits all arms. Blade rolls in action, no bending of rubbers. 7-ply wiping features give 100% wiping, therefore, clear vision at all times.

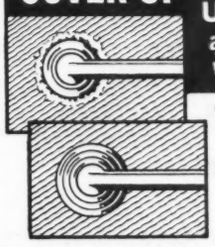
**HACKETT AUTOMOTIVE ACCESSORIES CORP.**

Providence, R. I. U. S. A.

Mfrs. of Wiper Arms, Dual Wiper Attachments, Inside Wipers, License Plate Frames, Cigar Lighters, Magnetic Trouble Lights, Shimmy Stops, Parking and Fender Guides, etc.



**COVER UP WORN UPHOLSTERY around door and window handles**



**with these No. 197 DeLuxe OVERSIZE HANDLE PLATES for all cars**

*Write* **for sample and information**

**L. F. KREGER MANUFACTURING CO.**

**544 West 35th Street, Chicago**



**TOUGH TOOLS for TOUGH JOBS**

BACKED BY *20 years experience*

**National** MACHINE & TOOL CO.

JACKSON, MICHIGAN

CLUTCH ALIGNMENT TOOL

No. U-204

Does a sure-fire job on 95% of all cars on the road. Saves time and assures quick, satisfactory work on clutch jobs.



**BURTON**

Electrical instruments essential to good service are the Hoyt Junior Cell Tester and Starter Current Indicator that tell without connections. Ask your jobber or write us. Burton-Rogers Company, 755 Boylston Street, Boston, Massachusetts.

**ROGERS**

MAREMONT SPRINGS

Maremont ALLOY STEEL Springs

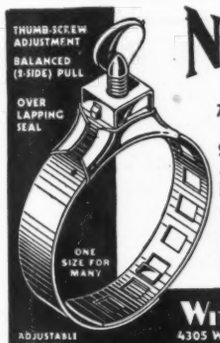
**There's A Difference In Springs, Too!**

Car, truck and bus owners want something different, something better. In springs, that means Maremont scientifically heat-treated springs. Easier to install because they are made to exact car makers' specifications. Ask your jobber or write, Dept. MA.

MAREMONT AUTOMOTIVE PRODUCTS, INC.
SO. ASHLAND AVE. AT 17th ST., CHICAGO, U.S.A.

Our new Super Scraper Set for your next reconditioned motor will show you a new oil economy. They are shaped to ride over the film of oil. Your Jobber will serve you.

THE INTERNATIONAL PISTON RING CO.
CLEVELAND, OHIO




TRADE MARK
NOC-OUT HOSE CLAMPS
*THE HOSE CLAMP WITH THE THUMB SCREW*

Standard equipment of the automotive industry. Adjustable - one size equals many. Quick tightening, perfect seal. At all Jobbers.

Pat. No. 1,382,813.

WITTEK MFG. CO.
4305 W. 24th Pl., Chicago, U.S.A.

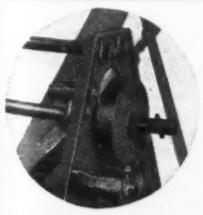
**Old and NEW Tires Made Safer!**

Once again Kwick-Kut pioneers in grooving equipment with the development of a sensational new blade to cut a narrow strip of rubber 1/16" wide. New tires are made safer and old tires made safe as new—in fact, non-skid if re-grooved with narrow parallel grooves.

This Kwick-Kut blade is the greatest safety development since hydraulic brakes—and you won't have any trouble selling the idea to winter drivers.

Order this blade today—it has every exclusive feature of the Kwick-Kut line.

**KWICK-KUT MFG. COMPANY**
3854 Arsenal St. St. Louis, Mo.



The lowering brake on the Remco Wrecking Crane is a feature found heretofore only on the highest priced cranes. This Remco Crane offers every new invention for added strength, power, speed and safety, without high price. **Manley Products Corp., State & Hay Sts., York, Pa.**

**REMCO**
**SHOP EQUIPMENT**
Hydraulic Presses, Wrecking Cranes, Car Washers, Jacks, Trestles Creepers, Oil Spray Guns, etc.

## *Three New Club Members*

Automobile racing's 100-Mile-an-Hour Club will receive three newly qualified members at that organization's third annual banquet meeting in Indianapolis on May 25, six days before the International 500 Mile Sweepstakes at the Indianapolis Motor Speedway on May 31.

The group of new eligibles was announced at headquarters of the Contest Board of the American Automobile Association, national governing body of auto racing, by Ted Allen, Secretary of the Contest Board and a member of the board of governors for the Champion 100-Mile-An-Hour Club. They are: Ted Horn; Ray Pixley, who was subsequently killed in an accident at Roby; George Barringer; and Zeke Meyer, the oldest driver in the race with his son as riding mechanic. In the 1936 Indianapolis classic all four of these drivers completed the 500-mile grind without relief at an average speed of 100 miles per hour or more. Nine drivers averaged over 100 miles an hour last year, but the others are already members of the club.

At the banquet at the Indianapolis Athletic Club, the new members will be presented with certificates and engraved lapel pins. The awards are made possible by M. C. Dewitt, Vice-President of the Champion Spark Plug Company. Mr. Dewitt is a member of the Club board of governers, serving with Allen, Captain Eddie Rickenbacker, Chairman of the Contest Board, and T. E. Myers, General Manager of the Indianapolis Speedway.

## *American Bantam Production*

Production of the new American Bantam automobile will start within 60 days, R. S. Evans, president, stated last month.

Quarter-ton trucks, in panel and pick-up body styles, will be featured by the company. A line of passenger cars will include a business coupe, standard and de luxe coupe, roadster and custom-built speedster.

The new car will be produced in the plant of the former American Austin Car Company which was acquired by The American Bantam Car Company last summer.

### Sealed Power Personnel Changes

C. E. Johnson, president of the Sealed Power Corp., has announced several changes in executive personnel. L. G. Matthews, formerly sales manager, has been advanced to the position of assistant treasurer in place of L. D. Drake, who is no longer with the corporation. Paul R. Beardsley, who with Mr. Johnson founded the business in 1911, is treasurer.

Responsibility for sales will be divided among three men under Neil A. Moore, general manager. They are Paul C. Johnson, manager of original equipment sales; W. O. Banta, manager of replacement sales; John E. Norwood, manager of sales promotion. Mr. Banta is being moved to Muskegon from the west where he has been district manager in charge of California and Arizona. He will be succeeded by W. S. Nichols, who has been his assistant.

**BINKS ANNOUNCE PHENOMENAL NEW SPRAY GUN**

**SPRAYS WITH GREAT SPEED LESS CONSUMPTION OF AIR AND THE GREATEST POSSIBLE ATOMIZATION**

This Company offers the smoothest working, fastest production gun for fine finishing known.

Nothing exceeds in importance the final finishing of used automobiles being prepared for resale—it is here that big profits lurk in a tremendous field—the resale of cars.

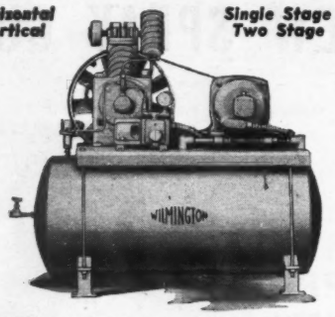
Beautiful glistening paint on your used cars improves them—makes them sell much more readily and will substantially increase your used car values and "speed up" your turnover with more sales — good finish sells itself.

Thor Model 7 Spray Gun is designed for spraying the new synthetic materials and is the finest possible spray gun for all materials. Cash in with this speedy—economical product paint finishing gun—made by a company making spray equipment since 1893—Binks engineers worked in cooperation with engineers of some of the largest plants in this country—Write for catalog containing valuable information.

**BINKS MANUFACTURING CO.**
3114-40 Carroll Ave. CHICAGO
Write Today—Dept. SG7

**WILMINGTON**
COMPRESSORS

Horizontal Vertical — Single Stage Two Stage




**"FREE" Air? Practically!**

Low maintenance costs—so low your air is practically free except for power charges—is the reason you should own a Wilmington. The non-pulsating check valve lasts years longer than pressure operated types. The motor can't burn out from starting overloads. Air is cleaned to reduce wear, de-oiled to protect tires and hose. Timken bearings. Highest quality throughout, but priced in line. Send for catalog.

The Auto Compressor Co.
S. Mulberry St., Wilmington, Ohio



**SEEPAGE**
OF COOLING LIQUIDS
**RUINS ANY HEAD GASKET**

*Unless Installed the "Factory Way"*
COATED WITH GENUINE

**"PERFECT SEAL"**

AS SPECIFIED BY 16 OF THE LEADING CAR MANUFACTURERS

Ask Your Jobber or the Car Distributor or Write Direct to Factory.

**P.O.B.MFG.CO., CINCINNATI**



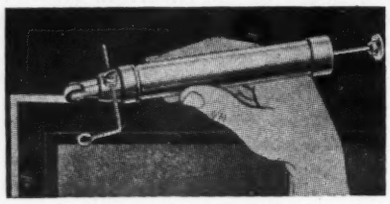
FOR A REAL SPRING SALES BOOM!
**WONDER WELD**

For many a spring valve port and inside cylinder crack repair job, dealers and repairmen want Wonder Weld. It does the job in 30 minutes!

**MILLER MFG. CO.**
1218 KAIGHN AVE., CAMDEN, N. J.

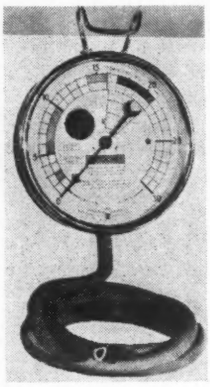

## *Wendell Paint Striper Uses Forced Feed*

A paint striper using a forced feed has been announced by Wendell Mfg. Co., 2535 N. Ashland Ave., Chicago, Ill. It is ideal for every kind of striping job, since it can be used in any position. As the paint is used, the plunger inside the tube is moved forward, bringing the paint to the wheel.



Supplied with seven stripe width sizes from 1/32 in. to 3/16 in. All striper head parts are chromium-plated and polished. Complete outfit packed in strong wooden compartment case, priced at $8.50.

## *Motochek Gage For Engine Tune-Up*



A new mercury type vacuum gage for motor tune-up and booster brake testing has been announced by Universal Chemists, Eastern Division, Boston, Mass. It is made of durable chromium brass drawn case, hermetically sealed against moisture and gives true readings under all conditions. Dealer's net price $18.75.

## *Kansas City A.T.A. Inspections*

A safety inspection campaign has been inaugurated by the Automotive Trades Assn. of greater Kansas City, Mo., in conjunction with the city-wide accident prevention drive there. Some of the features of the campaign includes free safety inspections, windshield stickers for cars, and rejection slips for cars failing to pass tests. The drive extends from April 1 to June 30.

### Air Passengers

Air lines operated by American companies (domestic and foreign extensions) carried 1,147,969 passengers and 8,350,010 lb. of express during 1936, the Bureau of Air Commerce has announced. In 1935 the lines carried 860,761 passengers and 5,511,737 lb. of express. Miles flown by all scheduled operators last year were 73,303,836, compared with 63,540,233 in 1935. There were 380 airplanes in operation on the lines at the end of the year; 9972 persons were employed; and 37,057,069 gal. of gasoline and 871,663 gal. of oil were consumed.


**SPRING THUMPS IN THE SPRING**

MEAN
SPRING JOBS FOR YOU
When You Install
**SPRING SADDLE SILENCERS**

Car owners will want to meet the spring with cars that don't rumble like gun carriages. One size fits most popular cars. Ask your jobber today or write.

**CURTISS & SMITH MFG. CORP**
POTTSTOWN, PENNSYLVANIA



*There's Money in Wheel Balancing Service!*

Pat. No. 2036757

Many garages are making hundreds of dollars every year by rendering wheel balancing service. Why not you? The cost of an L & H Balancing Stand and Balancing Weights is surprisingly small—but the profits they will earn are surprisingly large. Investigate!

HARLEY C. LONEY CO.
16517 Wisconsin, Detroit, Mich.

WRITE for CIRCULAR!



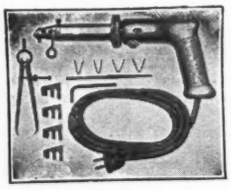
**A NEW LOW PRICED**
**STEER - O - MASTER**

A complete front end and wheel alignment service unit, all analytical and corrective equipment included, at a price that makes this type of service more profitable than ever. Write for details.

**RIESS MANUFACTURING CO.**
Kokomo, Indiana



**CHAMPION Tire Groover**
Means Extra
**PROFITS**




Exclusive features! One hand control! Heats quickly and is easy to operate. The New Champion has a removable heating element, easily and quickly replaced. For bigger profits in tire grooving, get the New Champion. Write today for illustrated folder and full information.

ALLIED MANUFACTURERS, INC.
408 River St. Ypsilanti, Mich.


## Classified

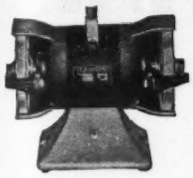

Motor Temperature Gauges repaired $1.50. Missing parts replaced. Originators of this service. Factory Methods. Radiator Shutter Thermostats repaired $2.50. United Speedometer Repair Co., Inc., 436 W. 57th St., New York City.

INVENTORS—Protect your rights. Before disclosing your invention to anyone send for free blank form "Evidence of Conception" and instructions. Personal attention given all cases. Lancaster, Allwine & Rommel, 415 Bowen Building, Washington, D. C.

**BALDOR**

FORMERLY NAMED "HANDY"

**GRINDERS**



Ruggedly built, Ball Bearing Capacitor type motor protects against burn out. Adjustable tool rests. Guaranteed one year... **$19.50**

*With wire brush on right side instead of grinding wheel*..... **$20.50**

**BALDOR ELECTRIC CO.**
4375 Duncan Ave. St. Louis, Mo.

**LOWER VOLTAGE DROP**

LESS WASTED POWER WITH THE

**CONTINENTAL**
*Cetron Mercury*
**RECTIFIER**
**Type 2-Ra-6**

2 Volts—
13½ Amperes
Output—
6 Amps.
List—$6.00

And, besides saving power, this newest of rectifier bulbs, with the toughest rectifier filament ever devised, uses one-third less current than conventional charger bulbs. Ask your jobber or write.

**CONTINENTAL ELECTRIC COMPANY**
Geneva, 5, Illinois

**NEW C250 5 METAL DRAWER COMPLETE CHEVROLET ASSORTMENT**
*Write for C250 Catalogue*
**L-LINKERT CARBURETOR CO.**
INDIANAPOLIS, INDIANA

**AUTO TRIM MATERIALS**

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Special price on ton lots

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8311 Epworth Blvd., Detroit, Mich.

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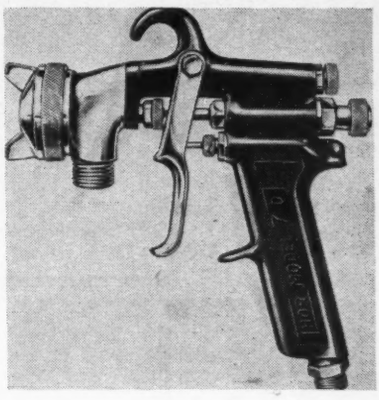
An attractive aid to parking, backing, turning, Spin-Ur-Wheel is a fast seller with car owners. Instantly attachable, it fits all steering wheels. In five popular colors, with and without jewel. Base finished in chrome or enamel.

*Ask your jobber for full information.*

**SINKO TOOL & MFG. CO.**
351-371 N. Crawford Ave., Chicago, Ill.


## *Spray Gun For Heavy Materials*

A new Thor Model 7-D spray gun has been announced by The Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill. It is designed to handle heavy materials such as cut-back asphalts, sound



deadeners, insulating materials, roof and car cements, heavy stucco and cement paints. Supplied with ¼-in. or 5/16-in. nozzle, and operates on 60-75 lb. air pressure.

## *Hypoid Lubricant Dispenser*

The Service Station Equipment Co., Conshohocken, Pa., has announced a new hypoid lubricant dispenser which consists of a bedplate and pump for attaching to any standard 25-lb. drum. It is designated as Model 25-H, and provides a quick, efficient means of lubricating hypoid gears direct from the original 25-lb. container, thus eliminating waste. A catalog describing the complete line of Bennett Grease Dispensers will be sent upon request.

### Designs for Sale

Delage, the French automobile manufacturer, is offering for sale a set of drawing for a racing car to fit the 1938-1940 international formula, according to the Contest Board of the American Automobile Association. Engineer Lory, who has designed all the racing Delages since the war, prepared the designs. They are for a 12-cylinder V engine of 183 cu. in. displacement, mounted at the rear with rear drive, independent wheel suspension all around, four or five speed transmission, low center of gravity, reduced overall height and scientific streamlining. One of M. Lory's racers, a 12-year-old 91½ cu. in. job that "cleaned up every race it was entered in last year" was recently sold in England for $18,000.

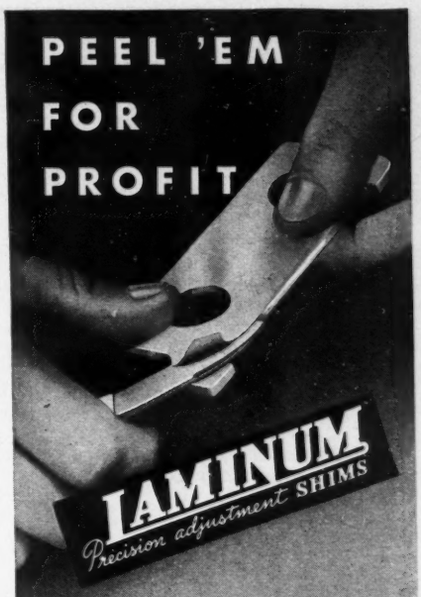
## *Plant Reopened*

The John Wood Manufacturing Company, Inc., Conshohocken, Pa., the American operating company of the International Metal Industries, Ltd., Toronto, Canada, announces the reopening of its plant in Muskegon, Mich., formerly occupied by the Bennett Pumps Corporation. The Muskegon plant will be used for the manufacture of Bennett gasoline pumps, highboys; grease, lubricating oil, kerosene and alcohol pumps; also Eco Tireflators, Tiremeters and air compressors.

As in the past, these products will be distributed through their domestic selling company, Service Station Equipment Company, which will maintain its general sales and administrative offices in Conshohocken, with branches in all principal cities.

### Race Driver Killed

Joe Wersits, dirt track driver and member of the Speedway Racing Assn. of Philadelphia, was killed when a passenger train struck the motor truck which he was driving near Camden, N. J., last month.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Precision adjustments—quick! Right at the job. No miking, no filing!... Just peel precision laminations from the brass LAMINUM shim. Standard for all makes of engines. PEEL 'EM FOR PROFIT!

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*Sound Range 1 to 10 Miles*

Horns that meet the most exacting standards of serviceability and distinction. For busses, trucks, passenger cars, boats.

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